### **AUTHOR INDEX**

A

Abbas, H. M., 369 Acton, A. B., 73, 78, 87, 89, 98 Adler, S., 417 Ahmad, M., 153, 154 Akesson, N. B., 336 Albrecht, F. O., 280, 288 Alexander, B. H., 304 Alibert, H., 368 Alisov, B. P., 135 Allee, W. C., 244, 245, 247 Allman, S. L., 176, 181 Altmann, G., 44 Alverdes, F., 407 Amosova, I. S., 136 Amotz, Y. B., see Ben Amotz, Y. Amsden, R., 342 Anderson, A. D., 318 Anderson, C., 416, 418 Anderson, E., 19, 26, 30, Anderson, L. D., 272, 273, 274, 355 Anderson, L. W., 202 Anderson, N. L., 290 Anderson, T. F., 17, 19 Anderson, W. H., 123, 130, 183 Anderssen, E. E., 180, 188, 189, 358 Andrewartha, H. G., 219-42; 143, 219, 220, 225, 226, 228, 229, 234, 237, 244, 248, 252 Andrews, T., 305 Anscombe, F. J., 252 Applewhite, K. H., 145 Armstrong, J. A., 144 Arnal, A., 139 Arnold, F. J., 399 Arvy, L., 37 Ascher, K. R. S., 309, 310, Aschner, M., 405 Ashall, C., 280, 282, 283 Ashbel, R., 417 Asperen, K. van, 313, 314, 315 Atkins, E. L., Jr., 272, 273, 274, 354, 355, 370 Attaih, H. H., 367 Auclair, J. L., 54, 59, 63, 204 Auer, C., 254, 255 Autuori, M., 369 Avnon, G., 196, 197, 199,

200, 201, 202, 203, 204, 205, 208, 211

B

Babers, F. H., 304, 305 Babers, F. W., 319 Baccetti, B., 62 Back, E. A., 175, 176, 177, 178, 179, 180 Bagster-Wilson, D., 392, 396 Bahmanyar, M., 416, 417 Bahr, G. F., L. Baich, A., 311 Bajpai, R. N., 371 Bajpai, A. C., 173, 177, 178, 179, 180, 185, 186, 187 Baker, E. W., 185 Balch, R. E., 248 Ball, H. J., 202 Ball, W. L., 394 Balock, J. W., 363 Baltazard, M., 408, 416, 417 Bami, H. L., 308 Bancroft, T. A., 252, 254 Bandyopadhyay, K. S., 257 Banks, C. J., 256 Banks, N., 157, 158, 160, 161, 166 Baranowski, R. M., 3, 4 Barbesgaard, P., 310 Barker, R. J., 304 Barkley, J. H., 369 Barnes, A. G., 389 Barnes, J. M., 301, 379, 388 Barnes, M. M., 356 Barnhardt, C. S., 369 Barr, A. R., 135, 136, 142 Barsa, M. C., 303 Barta, R. A., Jr., 399 Bartel, A. H., 56, 58 Barthel, W. F., 144, 319 Bartholomew, E. T., 356, 357, 358 Bartlett, B. R., 356, 357 Bartlett, J. R., 364 Bar-zeev, M., 141, 144 Basrur, V. R., 75, 79 Bässler, U., 135, 139 Batchelder, C. H., 343 Batchelor, G. S., 387, 389, 390, 392, 393, 394 Bateman, M. A., 183, 239, 240, 241 Bates, M., 135, 140

Bathellier, J., 161, 164, Battaglia, B., 99, 225 Baumhover, A. H., 225 Bayreuther, K., 70, 71 Beadle, G. W., 86, 87 Beall, G., 252, 254 Beams, H. W., 18, 19, 22, 26, 28, 30, 31, 60 Bean, J. L., 248 Beck, S. D., 202, 213 Beckel, W. E., 139 Becker, P., 138 Becla, E., 408 Beermann, W., 27, 73, 75, 87 Beklemishev, W. N., 137, 143 Belkin, J. N., 136 Ben Amotz, Y., 347 Benedict, A. A., 138 Benjamin, F. H., 184 Benjamini, E., 302 Bennett, F. D., 79 Bennett, J. H., 99 Bennison, B. E., 395 Benwitz, G., 37 Berg, C. O., 143 Bergerard, J., 74 Berkaloff, A., 28, 60, 61 Beroza, M., 360, 361, 362 Bettini, S., 318 Beverton, R. J. H., 245, 248, 260 Bidstrup, P. L., 390 Bieber, I., 395 Bieling, R., 407 Birch, L. C., 219-42; 92, 99, 143, 219, 220, 225, 226, 228, 229, 231, 232, 234, 237, 244, 248, 252 Bishop, H. J., 355, 356, 359 Biskind, M. S., 395 Bitancourt, A. A., 367 Bitter, B. A., 225 Bjork, L. B., 32 Blaizot, L., 415 Blake, J. R., 391 Blanc, F. L., 184, 185 Blanc, G., 408, 414, 415 Blinn, R. C., 356 Bliss, C. I., 172, 178, 179, 180, 252 Blum, M. S., 307 Blumenheim, U., 90 Blunt, D. L., 293 Boccacci, M., 318 Bochnig, V., 307, 308

Bodenheimer, F. S., 283,

284, 287, 288, 353 Boettiger, E. G., 1-16; 1, 2, 4, 5, 6, 8, 10, 11 Boggild, O., 303 Bogoyavlenskii, S. G., 273 Bohart, G. E., 268, 272, 273, 274 Bohart, R. M., 112, 137 Bold, T. J., 143 Bonhag, P. F., 137 Bonnell, J. A. L., 390 Borg, A. F., 139
Böttcher, F. K., 272
Bounhiol, J. J., 37, 38, 41
Bouriquet, G., 295 Böving, A. G., 113, 115, 116, 117, 121, 122, 123, 124, 127, 128 Bowen, H. D., 341 Bowery, T. G. , 57 Bowman, B. M., 292 Boyce, A. M., 174, 176, 177, 179, 182, 183, 353, 365, 367, 369 Boynton, D., 344 Bradbury, F. R., 312 Bradfield, J. R. G., 32, 60, 61 Bradley, D. E., 339 Bradley, R. H. E., 254 Bradley, W. R., 393 Braid, P. E., 393, 394 Brand, T. von, 138 Brandenburg, J., 37, 38 Brann, J. J., 344, 345, 348 Braun, H. A., 388 Breev, N., 142 Brett, C. H., 279, 280 Brian, M. V., 162, 166, 229, 230 Bridges, P. M., 316 Bridges, R. G., 312 Briggs, M., 29, 57 Brindley, T. A., 252, 254 Brittain, W. H., 266, 268 Brncic, D., 101, 102 Broadbent, B. M., 354, 355, 356 Brooks, F. E., 173, 174, 175, 178 Brooks, G. T., 311 Brown, A. W. A., 301-26; 138, 141, 142, 143, 144, 295, 301, 305, 306, 308, 309, 310, 313, 316, 317 Brown, E. S., 158, 160 Brown, R. F., 135, 144 Brown, S. W., 79 Brown, W. L., 230, 284 Bruce, W. N., 316 Brugnoni, H. C., 367 Bruhn, A. F., 132 Brummer-Korvenkontio, M., Brunet, P. C. J., 28, 30 Brünner, A., Jr., 17, 19

Brunskill, R. T., 340 Bruzzone, R. M., 281, 283 Buchli, H., 161, 162, 163, 164, 165, 166
Buchthal, F., 2, 7, 8
Buckner, A. J., 306, 310, 311 Buckner, C. H., 246 Buhman, L. B., 145 Buhr, H., 206, 208 Burcham, E., 139 Burden, G. S., 306 Burgess, L., 135, 141, 142 Burkhardt, C. C., 269 Burla, H., 99, 100, 101 Burley, V. V., 143 Burnett, G. F., 281, 283, 286 Burnett, T., 232 Burrell, A. B., 269, 270, 344 Bursell, E., 234, 235 Busbey, R. L., 317 Bushland, R. C., 225 Busvine, J. R., 301, 306, 308, 309, 310, 313, 314, 316 Butler, C. G., 266, 268, 269 Butt, D. J., 344 Button, J. A., 407 Butts, J. S., 305, 308 Buxton, P. A., 234, 235, 236, 405 Buzzard, E. N., 269

C

Cabasso, V., 406 Cabido Garcia, R., 360 Caesar, R., 22 Calaby, J. H., 157, 160, 161 Calhoun, D. W., 252 Callan, H. G., 70, 76 Cameron, A. E., 368 Cameron, M. L., 44, 46 Campbell, A., 312 Campos, L., 357 Cancela da Fonseca, J., 360 Canizo, J. del, 289 Cann, H. M., 387, 399 Cannon, P. R., 409 Capenos, J., 25 Caplan, P. E., 392, 394 Carleton, W. M., 341 Carlisle, D. B., 35, 39, 43 Carman, G. E., 353-78; 354, 355, 356, 357, 358, 366, 368 Carne, P. B., 222, 223, Carolin, V. M., 245 Carpenter, S. J., 135, 136 Carson, H. L., 79, 86, 87, 88, 89, 97, 98, 101, 102, 103 Cartier, J. J., 204 Casida, J. E., 313 Casimir, M., 294 Caspari, E., 38 Castañeda, M. R., 414 Castle, G. B., 157, 162, 163, 164, 166 Cazal, P., 37 Cendana, S. M., 371 Cenóz, O. T., see Trujillo-Cenóz, O. Cerf, J., 6 Chadwick, L. E., 40, 301, 313 Chagin, K. P., 140, 145 Challice, C. E., 20 Chamberlain, J. C., 335 Chamberlain, R. W., 136, 316 Chance, B., 13 Chang, S. C., 305 Chao, S. H., 415 Chapcheff, C., 415 Chapman, G. B., 19, 21 Chapman, R. A., 243, 245, 253, 255 Chapman, R. F., 207 Chattoraj, A. N., 307, 308 Chauvin, R., 194, 205, 244, 250, 273 Zoo, 213 Chefurka, W., 14 Chen, S. H., 129 Cherian, M. C., 173, 175 Chernisheva, F. I., 143 Cheu, S. P., 279, 288 Chin, C. T., 200, 212 Chinnick, L. J., 75, 76 Chorine, V., 408 Chowdbury, S., 370 Christensen, B. E., 305 Christenson, L. D., 171-92; 175, 226, 362 Christophers, S. R., 135, 137 Chûjô, M., 129 Chung, H. L., 415, 416 Church, B. M., 254 Church, N. S., 38, 42 Clark, L. R., 292 Clark, P. H., 316 Clark, P. J., 252 Clarke, J. M., 95 Claus, G., 75 Clausen, C. P., 186, 353 Clayton, B. P., 31, 32 Clément, G., 159, 162, 164 Clements, A. N., 135, 136, 138 Clemete, F. G., see Gomez Clemete, F. Coaton, W. G. H., 156, 157, 158, 159, 160, 163, 165, 167 Cochran, D. G., 305 Cochran, G. W., 29, 57 Cochran, W. G., 243, 253

Codeleoncini, E., 411

Cohen, S., 302 Coker, W. Z., 308 Cole, L. C., 252, 253, 289 Cole, M. M., 306 Coleman, A. L., 394 Coleno, P., 282 Collins, C. L., 141 Complin, J. O., 364, 365, 366. 367 Conley, B. E., 386 Connell, L. J., 315 Conseil, E., 415 Constantino, G., 355, 367 Contis, G., 25 Cook, J. W., 391 Cooper, K. W., 71 Cooper, W. C., 394 Coplen, B. E. P., 201 Corrigan, J. J., 304 Cortes, R., 357 Cotty, V. F., 304 Couch, M. O., 306 Courshee, R. J., 327-52; 329, 330, 336, 339, 342, 344, 350 Coutts, M. H., 336 Craig, G. B., 137 Craig, R., 53-68; 56, 58, 59. 64 Craighead, F. C., 113, 115, 116, 117, 121, 122, 123, 124, 127, 128, 129 Crane, M. B., 269 Crespi, H., 302 Cressman, A. W., 354, 355, 356, 357 Crichton, G. B., 293 Crombie, A. C., 195, 203 Cross, H. F., 145 Crossley, H., 143 Crow, J. F., 301, 307 Crowson, R. A., 111-34; 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 123, 214, 216, 127, 128, 129, 130, 131 Crystal, M. M., 409 Cuénod, A., 407 Cueto, C., 389 Cueto, C., Jr., 387, 389, 390 Cullen, W. P., 57 Culpepper, G. H., Culver, D., 392, 394 Cunha, A. B. da, 85-110; 69, 80, 86, 89, 92, 93, 99, 100, 101, 102 Currie, B. W., 135 Curtis, J. T., 252 Cutkomp, L. K., 305

da Cunha, A. B., see Cunha, A. B. da da Fonseca, J. C., see Cancela da Fonseca, J.

D'Aguanno, W., 388 Daguerre, J. B., 281, 283, 285 Dahm, P. A., 57, 301, 303, 304, 305, 306, 316 D'Alessandro, G., 310 Daniel, M., 17 Danneel, R., 25 Dansereau, P., 100 Darby, H. H., 173, 178, 180 Darlington, C. D., 86, 104 Darlington, P. J., 114 da Rocha Lima, H., see Rocha Lima, H. da Darragh, J. H., 195, 203 Darsie, R. F., 138 Darwin, F. W., 5, 6, 10 Dass, C. M. S., 32 Dauterman, W. D., 315 Davenport, A. A., 36 Davey, J. T., 281, 284, 288 Davey, P. M., 287 Davidow, B., 311 Davidson, G., 309, 311, 312 Davidson, J., 248 Davies, D. E., 285, 290 Davies, D. M., 135, 137, 140, 144 Davies, G. M., 395 Davies, L., 140, 142, 143 Davies, M., 316 Davis, C. J., 174 Davis, J. M., 350 Davis, K. J., 388 Day, M. F., 27, 29, 57, 62, 135, 136, 138, 139, 280 Dean, H. A., 370 Dean, R. W., 179, 182 DeBach, P., 259, 359, 364 Decelle, J., 369 Decker, G. C., 316, 381 de Gryse, J. J., see Gryse, J. J. de Deguchi, K., 23 De Harven, E., 5, 19, 20, 21, 22, 23 del Canizo, J., see Canizo, J. del de Lerma, B., see Lerma, B. de DeLong, D. M., 138, 139 DeLury, D. B., 248, 255 Dempster, J. P., 248, 259, 279, 288 Denisova, Z. M., 138 Denmark, H. A., 364 Denz, F. A., 388 de Peyerimhoff, P., see Peyerimhoff, P. de de Pietri-Tonelli, P., see Pietri-Tonelli, P. de de Raadt, O. L. E., 408 der Kloot, W. G. V., see Van der Kloot, W. G.

DeRobertis, E., 31 Deroux-Stralla, D., 40 Desneux, J., 158 Deszyck, E. J., 354, 357 Dethier, V. G., 18, 135, 139, 144, 194, 195, 196, 198, 200, 201, 202, 203, 204, 205, 207, 208, 210, 211, 213, 215, 218 de T. Piza, S., see Piza, S. de T. Deuse, R., 47 Deutsch, A., 395 Deutsch, K., 31, 32 Devine, R. L., 19, 26, 28, 31 60 de Wilde, J., see Wilde, J. de de Zulueta, J., see Zulueta, J. de Dickinson, J. I., 102 Dickson, R. C., 317, 359, 368, 370 Dietz, H. F., 160, 161 Dietz, R., 71 Di Martino, E., 357, 367, 369, 370 Dimond, J. B., 138, 139 Dixon, E. M., 387 Dobzhansky, T., 88, 89, 91, 92, 93, 94, 95, 96, 98, 99, 100, 101, 237 Doenier, C. E., 335 Doherty, T., 393 Donnelly, U., 285, 290 d'Orchymont, R., see Orchymont, R. d' Dorsey, M. J., 265 Dowden, P. B., 245 Dowdeswell, W. H., 248 Downe, A. E. R., 140, 142 Downes, J. A., 135, 136, 137, 140, 142 Draize, J. H., 388 Dreyfus, A., 88 Drummond, F. H., 135, 137 Dubinin, N. P., 91, 102 DuBois, K. P., 391 Ducharme, E. P., 367 Dudley, F. H., 225 Duffy, E. A. J., 129 Dunbar, R. W., 135, 137 Du Plessis, C., 281, 283, 295 Dupont-Rabbe, M., 37, 43, 45, 47 Duret, J. P., 310 Durham, W. F., 387, 388, 390, 392, 396 Duspiva, F., 56 Dutilly, A. A., 135, 142 Dutt, M. K., 70 Düzgünes, Z., 367 Dzhafarov, S. M., 136

Ē

Earle, N. W., 307 Ebeling, W., 353, 358 Eckert, J. E., 272 Eddy, G. W., 306, 405 Edgar, R. S., 73 Edson, E. F., 390, 392, 394, 398 Edwards, B. A. B., 357 Edwards, G. A., 17-34; 4, 5, 17, 19, 20, 21, 22, 23, 24, 27 Eger, H., 211 Eidmann, H., 46 Eldefrawi, M. E., 305, 308, 315 Eliot, C. P., 409 Elizondo, A., 414 Elliott, J. W., 388, 389, 392. 396 Elliott, K. R., 350 Ellis, P. E., 280, 282, 283, 284 Elmer, H. S., 353, 354, 355, 356, 357, 366, 367, 369 Elton, C. S., 260 Emden, F. I. van, 113, 114, 115, 117, 123, 124, 130, 131, 132, 138 Emerson, A. E., 153, 154, 155, 156, 157, 158, 159, 160, 164, 244, 245, 247 Enders, E., 46 Endrödy-Younga, S., 118 Engelmann, F., 46 Enikolopov, S. K., 142 Epling, C., 89, 94, 95 Erickson, L. C., 358 Erwin, W. R., 305 Esselbaugh, C. O., 142 Estabrook, R. W., 13, 14 Eto, M., 66 Evans, F. C., 252 Evans, T. C., 22 Evans, W. A. E., 62 Ewan, H. G., 248 Ewart, W. H., 54, 55, 56, 353, 354, 355, 356, 357, 369 Ewen, A. B., 136 Ewing, H. E., 367 Eyssell, B. J., 286

F

Fairhall, L. T., 394
Fajans, E., 341, 347
Fales, J. H., 316
Fallis, A. M., 140
Farrar, C. L., 266, 267
Faure, J. C., 280, 281, 290
Fay, R. W., 315, 380
Feng, L. C., 415, 416
Ferguson, W. C., 307
Fernández-Morán, H., 25

368 Fettes, J. J., 248 Filmer, R. S., 266 Fink, D. E., 318 Finney, D. J., 251, 253, 254 Finney, G. L., 172 Fisher, C. D., 381, 382 Fisher, F. E., 364, 365 Fisher, R. A., 248, 252 Fitzhugh, O. G., 388, 391 Flanders, S. E., 368 Fleming, J. P., 395 Fleschner, C. A., 245, 365 Fletcher, T. E., 392, 396 Flitters, N. E., 174, 180, 181, 362 Flock, R. A., 368 Fogh, T. W., see Weis-Fogh, T. Foley, H., 416 Fonseca, J. da C., see Cancela da Fonseca, J. Foote, R. H., 171-92; 136 Forbes, W. T. M., 111, 112, 115, 117, 118, 122, 123, 124, 126, 127, 128, 130 Ford, E. B., 104, 248 Ford, W. W., 409 Forgash, A. J., 57, 305, 313, 315, 318 Formigoni, A., 37 Fortescue-Foulkes, J., 285, 290 Foulkes, J. F., see Fortescue-Foulkes, J. Fowler, R. E. L., 387 Fowler, W., 269 Fraenkel, G., 59, 138, 194, 203, 208, 210, 211, 212 Fraenkel, G. S., 201, 210, 211, 212 Francis, E., Francis, J. D., 142 Franz, J., 123, 245, 250, 257 Fraser, A., 37 Fraser, F. C., 102 Frawley, J. P., 391 Fredeen, F. J. H., 142 Free, J. B., 271, 272 Freeman, T. N., 135, 137, 140, 143 Freire, A. V., see Vallejo-Freire, A. Freire-Maia, N., 87, 88, 103 Frézal, P., 363 Friend, W. G., 194 Frings, H., 139, 140, 202 Frisch, K. von, 268 Frizzi, B., 47 Frizzi, G., 76, 310 Frohne, W. C., 140, 141, 142, 143

Frontali, N., 304
Fryer, J. D., 344
Fryimura, W., 31, 32
Fujitta, K., 355
Fukaya, M., 38, 42
Fukuda, J., 357, 359
Fukuda, S., 40, 45
Fukushima, K., 396
Fukuto, T. R., 57, 301, 313, 314
Fuller, C., 154, 162
Fuller, H. S., 406, 411
Fulton, R. A., 358
Furmanska, W., 303
Furshpan, E. J., 2, 6, 11
Fuyat, H. N., 391

-

Gabbutt, P. D., 249 Gabe, M., 35, 36, 37 Gahan, C. J., 129 Gahan, J. B., 313, 316 Gaines, T. B., 388 Gall, J. G., 32 Galun, R., 138 Ganelin, R. S., 387 Garcia, I., 59 Garcia, R. C., see Cabido Garcia, R. Garcia, S. P., see Planes Garcia, S. Gardner, J. C. M., 124 Garmus, R. D., 356 Garnham, P. C. C., 416, 417 Gartrell, F. E., 309 Garrell, F. E., 309 Gass, G. H., 388 Gay, F. J., 157, 160, 161 Gay, H., 27, 28 Gefter, V. A., 143 Geier, P., 257 Geigy, R., 144, 417 Gentil, K., 17 Georgala, M. B., 36 George, J. C., 12 Georghiou, G. P., 367 Gerhardt, P. D., 360, 368 Gerhardt, R. W., 135, 136 Gersch, M., 46, 47 Gertler, S. I., 144 Getzendaner, C. W., 335 Geyer, J. W., 281 Ghidini, G. M., 166 Gianotti, O., 311 Gibb, J. A., 249 Gibbons, I. R., 32 Gibson, F. J., 138 Gilbert, I. H., 306 Giles, G. M., 136 Gillatley, J. G., 370 Gillett, J. D., 45, 138 Girard, G., 408 Giroud, P., 414 Gjullin, C. M., 308 Glass, E. H., 307 Gleason, M. N., 399

Glover, P. E., 234, 235 Goetghebuer, M., 136 Goetsch, W., 154 Goette, M. B., 389, 390 Goldenthal, E. I., 388 Goldschmidt, E., 81, 102 Goldsmith, T. H., 25 Golz, H. H., 390 Gomez Clemete, F., 363 Goodall, M. C., 11 Gooderham, C. B., 266 Gordon, H. T., 60, 301 Gosselin, R. E., 379, 399 Gôto, E., 73 Gottlieb, M. I., 305 Gow, P. L., 172 Goytia, R. S., see Silva-Goytia, R. Graham, A. J., 225 Graham, S. A., 246, 247 Gralén, N., 27 Grant, T. J., 368 Grassé, P. P., 153, 154, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167 Gray, H. E., 59 Gray, R. A., 54, 55 Grayson, J. M., 305 Greathead, D. J., 287 Green, N., 360, 361, 362 Greenbank, D. O., 256, 259 Grell, M., 66 Griffiths, J. T., 354, 393 Griffiths, J. T., Jr., 355, 356, 365, 369 Griggs, W. H., 266, 270 Grison, P., 200, 202 Grob, D., 399 Grouvelle, A., 123 Grundfest, H., 6 Gryse, J. J. de, 244, 250 Gubin, A. F., 268 Guenin, H.-A., 73 Guicherd, P. P., 369 Guillemain, R., 368 Guillement, R., 367 Gulland, J., 245, 248, 255 Gunn, D. L., 279-300; 201, 248, 254, 279, 280, 282, 283, 285, 286, 287, 288, 289, 290, 294, 295, 337, Gunther, F. A., 354, 355, 356, 369 Gupta, P. D., 199, 201, 208 Gupta, R. L., 370 Guthrie, F. E., 57 Gutsevich, A. N., 143 Gutsevich, A. V., 135, 136, 140 Guyer, G., 250

Haasser, C., 27

Habibi, A., 416, 417 Hackman, R. H., 55, 56 Hadaway, A. B., 302, 312, 315 Haddock, J. L., 268 Haddork, W., Jr., 406 Haddorn, E., 47 Hagan, E. C., 388, 391 Hagen, K. S., 172, 173, 174, 180, 181, 360 Hagiwara, S., 5, 6, 7 Hahnert, W. F., Jr., 138 Halbwachs, M., 39, 40 Haldane, J. B. S., 91 Halkka, O., 74 Hall, J. A., 183 Hall, S. A., 360, 361, 362 Hall, W. J., 369 Hamrum, C. L., 139 Handlirsch, A., 111, 113, 121 Hanec, W., 203 Hanna, A. D., 173, 364 Hans, H., 197, 199, 202 Hansen, M. H., 243, 253, 256 Hansens, E. J., 313 Hanson, J., 5 Hanström, B., 36, 38 Haque, H., 369 Harbans Singh, 333 Harbans Singh, R., 370 Harding, P. L., 356 Hare, L., 154, 162 Harington, J. S., 56 Harker, J. E., 46 Harris, W. V., 158, 159, 160 Harrison, A., 311, 316, 319 Harrison, C. M., 316 Hartley, G. S., 340, 343 Hartung, W. J., 176, 177, 178, 180, 188 Hartwell, J. L., 395 Harvey, D. B., 390 Harvey, G. T., 310 Hase, A., 405 Hasegawa, K., 45, 46 Haseman, L., 317 Haskell, P. T., 140 Hatch, M. H., 113, 118 Haufe, W. O., 135, 141 Haupt, H., 111 Haviland, G. D., 167 Hawkins, L. A., 363 Hayes, W. J., Jr., 379-404: 387, 389, 390, 391, 392, 396 Heal, R. E., 305 Heath, H., 166 Hebblethwaite, P., 341 Heed, W. B., 79 Hegh, E., 156, 157, 158, 159, 160, 162, 165 Hein, R. E., 316 Heisch, R. B., 416, 417, 418

Heller, M. M., 123 Helwig, E. R., 77 Hely, P. C., 355, 357, 367, 370 Henderson, C. F., 365 Hendrickson, A. H., 266 Henriksen, K. L., 117 Henry, S. M., 304 Hepburn, G. A., 180, 188, 189, 355, 356, 359, 362 Heppel, L. A., 302 Herfs, A., 161 Hering, E. M., 207 Herlant-Meewis, H., 38, 40 Heron, R. J., 203 Herzig, A., 410 Hess, A., 23 Heuts, J., 91, 95 Hidaka, T., 45 Highnam, K. C., 42 Hill, A. V., 11 Hill, G. F., 156, 157, 158, 160 Hill, R., 195, 203 Hill, R. F., 295 Hilmoe, R. J., 302 Hinton, H. E., 35, 121, 122, 140 Hiraki, K., 399 Hocking, B., 135-52; 135, 139, 142, 144 Hodge, A. J., 21 Hodge, H. C., 399 Hodges, J. B., Jr., 399 Hodgson, E. S., 43, 139 Hoffman, R. A., 311 Hofstetter, M. N., see Narbel-Hofstetter, M. Hogan, T., 294 Holdgate, M. W., 17 Hollingsworth, M. J., 95 Holloway, J. K., 365 Holmgren, N., 154, 165 Holt, S. J., 245, 248, 260 Hopkins, B. A., 143 Hopkins, D. E., 225 Hopkins, L., 266 Hopkins, T. L., 316 Horasawa, I., 396 Horie, Y., 208 Hornbostel, H., 412, 415 Horsfall, W. R., 135, 137, 139, 140, 142 Hoskins, W. M., 301, 302, 305, 307, 308, 315, 347 Hosoi, T., 138 Hough, W. S., 317 Hovanitz, W., 135, 137 Howe, R. W., 248 Howell, D. E., 389 Hoyle, G., 2, 5, 6, 7 Hoyt, C. P., 135, 136 Hrbaček, J., 117, 118 Huber, W., 27 Hudson, B. N. A., 139

Hudson, B. W., 56, 58

Huffaker, C. B., 228, 232, 234
234
Hughes, R. D., 248
Hughes, W. A., 368
Hughes-Schrader, S., 72, 81, 82
Hunter, P. E., 308
Hunter-Jones, P., 280, 281, 288
Hurwitz, W. N., 243, 253, 256
Hutchinson, G. E., 229
Hutson, R., 250, 266, 268
Huxley, A. F., 4
Huxley, H. E., 21
Huxley, J. S., 85

I

Iba, S., 363
Ichikawa, M., 38, 41
Bkeda, K., 7
Illg, P., 166
Illingworth, J. F., 182, 183
Imms, A. D., 157
Inashima, M. D., 304
Ingram, F. R., 392
Irreverre, F., 53, 57, 58
Ishida, H., 31, 32
Ishida, H., 31, 32
Ishida, R., 63
Ishida, R., 63
Ishida, R., 63
Ishida, T., 306
Ikh, Y., 246, 248
Ivanov, K. V., 282
Ives, W. G. H., 249, 254
Iwai, M., 396
Iwakiri, B. T., 270
Iwata, T., 248

J

Jackson, C. H. N., 227, 234, 235, 236, 237 Jacob, J., 80 Jacobs, P. A., 70, 76 Jacobziner, H., 400 Jadin, J., 414 James, H. G., 142, 143 Jamnback, H., 135, 137, Jarman, R. T., 295, 338, 340 Jay, C., 196, 197, 199, 200, 201, 202, 203, 204, 205, 208, 211 Jaynes, H. A., 245 Jeannel, R., 111, 113, 114 Jeffree, E. P., 267, 269 Jellison, W. L., 143, 408, 410 Jenkins, C. F. H., 357, 370 Jenkins, D. W., 140, 142 Jensen, J. A., 142

Jeppson, L. R., 353-78; 354, 355, 357, 358, 364, 365, 366, 367 Jermy, T., 205, 208, 212 Jesser, M. J., 364, 365, 366, 367 Johansen, C., 273, 274 Johansson, A. S., 35, 38, 39, 45 John, B., 69, 70, 71, 73, 76, 88, 104 Johns, D. L., 344 Johns, R. J., 399 Johnson, J. M., 395 Johnson, M. McD., 368 Johnson, R. B., 357, 364, 367 Johnston, A. M., 318 Johnston, C., 140 Johnston, C. J. R., 355 Johnston, H. B., 281, 284, 288 Johnston, J. M., 387 Johnstone, H. F., 338, 339 Jolivet, P., 208 Joly, L., 39, 40 Joly, P., 39, 40 Jones, B. M., 40 Jones, J. C., 138 Jones, P. H., see Hunter-Jones, P. Jones, S. C., 184 Jones, T. P., see Palmer-Jones, T. Jones, W. I., 391 Jones, W. W., 367, 368 Jordan, H. E., 4 Jordan-Luke, B. M., 31, Joubert, G. F., 355 Joyce, R. J. V., 342 Juniper, B. E., 339

K

Kaelin, A., 254, 255
Kalmus, H., 144, 269
Kalra, A. N., 333
Kalra, R. L., 308
Kalshoven, L. G. E., 157, 159, 160, 161, 162, 163, 166
Kaluszynar, A., 302
Kapp, E. M., 173, 178, 180
Karafiat, H., 245, 250
Karlson, P., 40
Karmo, E. A., 269, 270
Karpov, S. P., 143
Karunakaran, C. O., 396
Kauri, H., 137
Kawai, T., 396
Kay, K., 393
Kearns, C. W., 301, 302, 304, 306, 307, 309, 310, 312, 316, 319

Keiding, J., 303, 310, 316 Keifer, H. H., 184, 185 Keilin, D., 175 Keller, J. C., 316 Kemper, H., 144 Kendrew, W. G., 135 Kennedy, J. S., 195, 197, 206, 212, 279, 280, 281, 283, 285, 288 Kennett, C. E., 232 Kerr, R. W., 302 Ketchel, M., 89, 96 Kettle, D. S., 135, 136, 140, 143, 144 Key, K. H. L., 75, 279, 280, 283, 284, 292 Khalaf, K., 136 Khan, J. A., 370 Khan, M. A., 142 Khan, M. S., 369 Khanna, K. L., 257 Khelevin, N. V., 141 Kikkawa, H., 308 Kilby, B. A., 63 Kilpatrick, J. W., 313, 315 King, G. E., 269, 270 King, J. R., 367 Kingscote, A. A., 144 Kinne, B. P., 89, 96 Kirby, H., 153 Kirimura, J., 41 Kiriyama, M., 23 Kitzmiller, J. B., 76, 135, 137 Klapperich, B. J., 367 Klinke, H. R., see Reichenbach-Klinke, H. Klomp, H., 246, 249 Kloot, W. G. V. der, see Van der Kloot, W. G. Klug, H., 43 Kluss, B. C., 30 Knab, F., 175 Knierim, J. A., 139 Knight, K. L., 135, 136, 137, 140, 142 Knipling, E. F., 225, 226 Knorr. L. C., 367 Knowles, F. G. W., 35, 39, 43 Knowlton, G. F., 272, 273, 274 Kobayashi, M., 37, 38, 39, 41, 46 Kocher, C., 318 Kojima, K., 306 Kolbe, H. J., 130 Komai, T., 102 Kono, T., 248 Kopec, S., 38 Köpf, H., 37, 38 Kopf, H., 308 Korda, F. H., 17, 19 Koremura, M., 357, 359 Kornberg, S. R. L., 395 Korsmeier, R. B., 367

Korvenkontio, M. B., see Brummer-Korvenkontio, M. Koshihara, H., 21 Koshtoyants, C., 42 Kozarzhevskaya, E. F., 360 Kremer, J. C., 269 Kriegler, P. J., 355 Kristjanson, A. M., 142 Krogh, A., 12 Krogh, A., 12 Krynski, S., 407, 408 Kubišta, V., 12, 13, 14 Kuchta, A., 408 Kühn, A., 38 Kunze, F. M., 389 Kunze, F. M., 389 Kunze, F. M., 389 Kunze, F. M., 381 Kurland, C. G., 317 Kuznetsov, N. Ya., 194

Τ.

Laarman, J. J., 135, 142 Laboulbène, A., 120 Labrecque, G. C., 313, 315 LaCasse, W. J., 135, 136 Lacordaire, T., 130 LaDue, J. P., 357, 358 LaFollette, J. R., 358, 369 Lagermalm, G., 27 Laird, E. F., 368 Lake, G. C., 408 Lalonde, D. I. V., 310 Lamb, K. P., 54, 55, 59 Lameere, A., 122, 128 Landi, J., 364 Landi, J. H., 359 Lang, C. A., 138 Larsen, E. B., 141 Larsen, J. R., 138 Lathrop, F. H., 172, 182, 183 Latif, A., 370 Laug, E. P., 388, 389 Laven, H., 72, 135, 137, 143 Lavoipierre, M. M. J., 142 Lawson, J. W. H., 135, 136 Lea, A., 281, 290, 293 Lea, A. O., 138, 139 Lebailly, C., 416 Le Berre, J. R., 197 Le Calvez, J., 71 Lee, R. K. S., 361 Lees. A. D., 179 Lehman, A. J., 388 Leland, S. J., 393 Lemmon, A. B., 392, 395 Lenz, F., 136 LePelley, R. E., 367 Lerma, B. de, 38 Leslie, P. H., 253 Lesne, P., 124 Lettieri, N., 355 Levenbook, L., 13

Levene, H., 89, 94, 95, 96, 101 Levin, M. D., 268 Levine, L., 96 Levine, R. P., 91, 102 Levitan, M., 89, 93, 97, 98 Levitanskaya, P. B., 143 Levitt, E. C., 357 Lewallen, L. L., 304, 315 Lewis, D. J., 135, 137, 142 Lewis, H. C., 358, 369 Lewis, I., 395 Lewis, K. R., 69, 70, 73, 76, 88, 104 Lewis, S. E., 14, 301, 311 Lewontin, R. C., 95 L'Hélias, C., 37, 40, 43 Lhoste, J., 37, 38, 310, 311 Li, C. C., 101 Lichtwardt, E. T., 302 Lieberman, F. V., 272, 273, 274 Lienk, S. E., 144 Light, S. F., 154, 157, 160, 161, 162, 163, 164, 165, 166, 168 Lima, H. da R., see Rocha Lima, H. da Linck, O., 112 Lindauer, M., 266, 267, 270, 271 Lindgren, D. L., 354, 360, 363 Lindquist, A. W., 225, 308, 311 Lindquist, D. A., 305, 306 Link, V. B., 408 Linsley, E. G., 185 Lipke, H., 194, 210, 211, 212, 301, 302, 304 Lippert, W., 17 Lister, C. A., 368 Lloyd, J. H., 287, 289, 294, 295 Lobstein, J., 355 Locke, M., 19 Lorgren, C. S., 305, 316 Logothetis, C., 283 Long, J. D., 408 Long, W. T., 354, 355, 368 Lorand, L., 11 Lord, K. A., 314 Losciavo, S., 205 Loukitch, G., 407 Lovell, J. B., 302 Lower, W. R., 95 Ludvik, G. F. , 309 Ludvik, J., 17 Ludwig, D., 57, 303 Lüers, H., 308 Lüers, T., 308 Luke, B. M. J., see

Jordan-Luke, B. M.

Lüscher, M., 46, 159, 164, 165, 166

M

McAlister, L. C., 183 McBride, J. J., Jr., 364 McBride, O. C., 358 McBurnie, H., 365 McCann, F. V., 5, 6, 7 MacCarthy, H. R., 290 McClean, A. P. D., 368 McClelland, P. H., 409 MacCuaig, R. D., 287, 295 McEnroe, W., 2, 5, 8, 57 MacFadyen, A., 244, 250 McFarland, R. H., 316 McGee, L. C., 395 McGrath, G., 395 McGregor, S. E., 265-78; 266, 272 McGugan, B. M., 255 McGuire, J. U., 252 Machin, K. E., 10, 11 McIntosh, R. P., 252 Mackensen, O., 78 McKenzie, R. E., 302 Mackerras, I. M., 135, 137 McKiel, J. A., 145 McKinlay, K. S., 342 MacKnight, R. H., 102 McPhail, M., 172, 173. 177, 178, 179, 180, 185, 186, 187 McShan, W. H., 12, 13, 14 Madge, P. E., 220 Madow, W. G., 243, 253, 256 Maelzer, D. A., 222, 223, 224 Maia, A. F., see Freire-Maia, A. Maia, N. F., see Freire-Maia, N. Mail, G. A., 387 Maki, M., 181 Malek, A. A. A., 137 Maltais, J. B., 54, 59, 204, 207 Manfield, T., 357 Manier, J. -F., 71 Manna, G. K., 73, 74, 105 Mansour, K., 115, 126 Marais, S. J. S., 290 March, R. B., 57, 304, 311, 313, 314, 315, 316, 356 Marchoux, E., 408 Maria, H. C. S., see Santa Maria, H. C., Mariani, M., 310 Mariconi, F. A. M., see Menazes Mariconi, F. A. Markovich, N. Y., 142 Marlatt, R. B., 266

Marshall, J., 348 Martignoni, M. E., 27 Martin, H., 194, 341, 347, 355, 363 Martynov, A. V., 111 Marucci, P. E., 182 Maruyama, K., 14, 21 Mather, K., 100, 269 Matheson, R., 135, 136 Mathis, W., 142, 380 Matsubara, H., 316 Matsumoto, Y., 200, 201 Matthée, J. J., 288, 291 Mattingly, P. F., 135, 137 Mattoni, R. H. T., 89, 94 Mattson, A. M., 311, 389 Maxon, M. G., 57, 314 Maxwell, D. E., 60, 72, 78, 79 Mayer, M., 409 Maynard Smith, J., 95 Maynard Smith, S., 95 Mayr, E., 185 Mazzi, V., 62 Mechovlam, R., 302 Meewis, H. H., see Herlant-Meewis, H. Meffert, R. L., 317 Megahed, M. M., 135, 136 Meixner, J., 123, 124 Mellon, D., 25 Melnikov, N. N., 144 Meltzer, J., 315 Menazes Mariconi, F. A., 363 Meneghini, M., 368 Menke, H. F., 270 Menn, J. J., 302 Menter, J. W., 17 Mer, G. G., 303 Mercado, T. I., 138 Mercer, E. H., 27, 28, 30 Merkin, S., 395 Merriam, R. W., 78 Merton, L. F. H., 279, 283 Mertts, A. A., 273 Messenger, P. S., 174, 180, 181, 362 Metcalf, R. L., 54, 55, 56, 57, 301, 310, 311, 313, 314, 315, 316, 317, 356 Meyer, G. F., 38, 60, 61 Mickel, C. E., 135, 137 Micks, D. W., 138, 304 Milani, R., 301, 302 Miles, P. O., 60 Miller, C. A., 245, 256, 259, 261 Miller, D. D., 87 Miller, D. L., 381, 382 Miller, R. S., 260 Milne, A., 258 Milner, K. C., 408, 410

Milzer, A., 407 Minatta, M. J., 360 Minderhoud, A., 269 Miskus, R., 305, 308, 315 Mitchel, W. C., 360 Mitchell, D. F., 89, 94 Mitlin, N., 319 Mitrofanov, P. I., 355 Mitsuhashi, J., 42 Mittler, T. E., 53, 55, 56, 50 Miyake, S. S., 304 Miyashita, D. H., 362 Miyashita, K., 246, 248 Moericke, V., 199 Mofidi, C., 416, 417 Molev, E. V., 140, 144 Monastero, S., 360 Monkman, L., 393 Monro, J., 42 Monros, F., 129 Monteiro, M. A., 62 Montschadsky, A. S., 135, 136, 140, 142, 143 Moore, B. P., 79 Moore, D. H., 27 Moore, M. H., 345 Moorefield, H. H., 301, 302 Moos, C., 11 Moos, J. R., 91, 96 Mooser, H., 410, 414, 415, 416, 417 Morán, H. F., see Fernández-Morán, H. Morant, V., 287, 290 Morgan, N. G., 337 Morigami, B., 396 Morii, K., 208 Morley, F. H. W., 75, 101, 103 Morohoshi, S., 46 Morris, G. C., 315 Morris, R. F., 243-64; 244, 246, 247, 249, 250, 251, 252, 253, 254, 256, 257, 259, 261 Morrison, P. E., 142, 143 Mosing, H., 410 Mosna, E., 309, 310 Mostofi, F. K., 395 Mothes, G., 47 Mott, D. G., 256, 259 Mudie, F., 293 Mühl, E. K., see Kunze-Mühl, E. Muir, F., 115, 116, 123 Muirhead-Thomson, R. C., 142 Mulhern, T. D., 143 Müller, E., 89, 102 Müller, H. J., 195 Munakata, K., 196, 200, 201 Munger, F., 354, 355, 356, 365, 366

Munk, F., 410 Munroe, E., 135 Munson, S. C., 305 Murnaghan, M. F., 145 Murphy, S. D., 391 Murray, E. S., 406, 411, 412, 415 Muto, T., 355 Mutto, R. N., 266 Myburgh, A. C., 368

#### N

Nabokov, V. A., 143, 144 Nagae, Y., 306 Namba, T., 399 Narahashi, T., 311, 313 Narbel-Hofstetter, M., 80 Nash, R. H., 143, 309 Nash, T. A. M., 234, 236 Nataf, R., 407 Natalizi, G., 318 Natvig, L. R., 135, 136 Nauck, E. G., 405 Naude, T. J., 354, 355 Nayar, K. K., 37, 38, 44 Neary, M. E., Nekrasov, V. U., 271 Nelson, A. A., 388 Nelson, H. D., 317, 358 Neri, I., 309, 310 Neville, E., 63 New, W. D., 225 Newton, R. C., 290, 292 Neyman, D. S., 387, 399 Nguy, V. D., 316 Nicholson, A. J., 143, 219, 229, 231, 288 Nicholson, H. P., 135, 137 Nickels, C. B., 172, 182, 183 Nickerson, N. H., 103 Nicolle, C., 415, 416, 418 Nicolsky, B. A., 143 Niekerk, O. T. van, 357, 358 Nielsen, A., 137 Nielsen, E. T., 139 Nishida, T., 173 Nishiitsutsuji-Uwo, J., 41 Nizovkin, V. K., 145 Noirot, C., 45, 153, 154, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 168 Nolan, W. J., 267 Nordby, A., 350 Norman, M. R., 342 Norman, P. A., 356, 368 Norris, M. J., 279, 287, 288 Noskova, E. G., 406

Nudel, Z. N., 144 Nuñez, J. A., 43 Nuorteva, P., 202, 203, 207, 213 Nuttonson, M. Y., 135 Nye, W. P., 268, 272, 273, 274

0

Oakland, G. B., 246 O'Brien, R., 78, 81, 104 O'Brien, R. D., 301, 313, 314. 315 O'Carroll, F. H., 312 Odum, E. P., 244, 248, 252 Ogaki, C., 355 Ogaki, M., 308 Ogata, K., 140, 142 Ogawa, S., 196, 200, 201 Ogita, Z., 319 Ogloblin, A., 281 Ohinata, K., 360 Ohmachi, F., 73, 74 Ohnesorge, Von B., see Yon Ohnesorge, B. Okudai, S., 357 O'Loughlin, G. T., 370 Olsen, R. W., 356 Olsuf'ev, N. G., 137 Omardeen, T. A., 139 O'Neal, B. R., 140 O'Neill, W. J., 270 Oppenfeld, H. von, 344 Oppenoorth, F. J., 312, 314, 315 Orchymont, R. d', 117, 118 Ordish, G., 292 O'Rourke, F. J., 135, 138, 143, 145 Ortega, J. C., 354, 355, 366, 367, 368 Ortelee, M. F., 390 Osburn, M. R. 356 Oshima, C., 308 Oshima, M., 157 Otamendi, J. C., 369 Otanes, F. Q., 290 Otten, L., 408 Overley, F. L., 270 Owen, A. R. G., 252 Owen, W. B., 135, 136 Owens, C. D., 271 Ozbas, S., 43

P

Packard, A. S., Jr., 282, 290
Paddock, F. B., 268
Page, W. A., 234, 236
Painter, R. H., 193, 198, 207, 208, 215
Pal, R., 314
Palade, G. E., 4

Palmer-Jones, T., 272, 273, 274 Palmieri, C., 310 Pant, C. P., 303 Paquet, L., 38, 40 Paré, J., 393 Parish, R. H., 144 Park, O., 244, 245, 247 Park, T., 244, 245, 247 Park, W. O., 268 Parker, J. R., 288, 290, 292, 295 Parker, R. R., 408 Partridge, M. H., 138 Pasquier, R., 283 Patch, E. M., 175, 183 Patton, R. L., 59, 64, 318 Paulian, R., 112, 117, 119, 120 Pavan, C., 93, 99 Pavlovsky, E. N., 140, 143 Pavlovsky, O., 94, 96, 99, 100 Pedersen, M. W., 268 Pemberton, C. E., 175, 176, 177, 178, 179, 180 Penick, A. E., 388 Pennypacker, M. I., 78 Perry, A. S., 301, 303, 306, 308, 309, 310, 311 Perry, F. C., 285 Persing, C. O., 369 Pervomaisky, G. S., 140, 145 Pet, J., 199 Peters, W., 144 Peterson, B. V., 135, 137, 140, 142 Peterson, D. G., 135, 142, 144 Petrishcheva, P. A., 144 Pew, W. D., 266 Peyerimhoff, P. de, 115, 117, 122, 125 Pfadt, R. F., 290 Pflugfelder, O., 38, 40 Philip, B., 27 Philip, C. B., 137, 407 Philip, U., 91 Phillipson, J., 142 Philp, G. L., 268 Philpott, D. E., 21, 25 Piccione, R., 355 Pickard, E., 141 Pickens, A. L., 160, 162, 163, 166 Pickering, L. R., 142 Pickett, A. D., 183 Piepho, H., 38, 39 Pietri-Tonelli, P. de, 367 Pipa, R., 3, 4 Pittendrigh, C. S., 240 Piza, S. de T., 70, 71, 75 Plagge, E., 38 Planes Garcia, S., 363 Platt, R. B., 141

Plummer, C. C., 173, 177, 178, 179, 180, 185, 186, 187 Podtiaguin, B., 281, 283 Poll, M., 115, 121, 123 Popov, G., 286 Popov, G. B., 287 Popov, V. M., 143 Porter, B. A., 178, 182, 183 Porter, K. R., 4 Porter, R. W., 36 Possompès, B., 35, 40 Postner, M., 272 Potter, C., 341 Potts, S. F., 348 Potts, W. H., 227 Powers, E. L., 31 Pratt, H. D., 136 Pratt, J. J., 135, 144 Pratt. R. M., 359, 365, 367 Prebble, M. L., 251, 257 Press, J. M., 392, 396 Press, N., 26 Prestage, J. J., 18 Price, G. M., 14 Price, R. D., 408, 410 Prickett, C. S., 389 Pringle, J. W. J., 1, 2, 3, 4, 5, 6, 10, 11, 12 Procter, P. J., 196, 197, 199, 200, 201, 202, 203, 204, 205, 208, 211 Pshenichnov, A. V., 406 Puchta, O., 405

Q

Quarterman, K. D., 142, 314, 380 Quayle, H. J., 354 Quenouille, M. H., 252 Quinby, G. E., 387, 389, 390, 392 Qutubuddin, M., 308

R

Raabe, M. D., see Dupont-Raabe, M. Raciot, C., 393 Radkowiak, J., 407 Radomski, J. L., 311 Radzivilovsky, Z. A., 140 Raffo, H. F., 31 Rahm, U., 135, 139, 141, 142 Rahm, U. H., 40, 42 Rai, L., 315 Rainey, R. C., 281, 282. 283, 284, 285, 286, 287, 294, 295 Ramsay, J. A., 53, 56, 59, 64, 65 Ramsey, L. L., 388 Randell, G. E., 358 Rao, S. R. V., 70

Rao, Y. R., 285, 286 Rasmussen, S., 203 Raucourt, M., 205, 206 Ray, B. R., 302 Raybin, H., 400 Redfield, H., 101, 102 Redtenbacher, L., 130 Reed, G. B., 145 Reed, H. L., 395 Reeks, W. A., 254 Rees, B. E., 121, 122 Reeves, W. C., 139 Rehm. M., 40 Reichenbach-Klinke, H., 66 Reichenow, E., 405 Reichmuth, W., 412 Reiff, M., 302, 303, 304, 315 Reinhart, W. H., 394 Reitz, H. J., 354, 355, 356, Remaudiére, G., 284, 288 Remm, H. Y., 140 Remm, K. I., 141 Rempel, J. G., 136 Rendel, J. M., 91 Reuter, S., 302 Rhoads, W. A., 358 Rhodan, J., 62 Rhode, R. H., 180 Ribbands, C. R., 268, 269, 273 Rich, S., 343, 346, 347 Richards, A. G., 17, 19 Richards, O. W., 248, 249 Ricker, W. E., 245, 248, 260 Riddell, R. T., 269, 270 Riehl, L. A., 358 Riek, E. F., 125 Riley, C. V., 282, 290 Ringel, S. J., 304 Ringler, R. L., 57 Riordan, D. F., 139 Ripley, L. B., 180, 188, 189 Ripley, R. B., 362 Ripper, W. E., 348 Ris, H., 32, 78 Risler, H., 78 Ritchie, J. M., 14 Rivera, C. T., 371 Rivnay, E., 178, 363, 364 Rivosecchi, L., 310 Roadhouse, L. A. O., 144 Roan, C. C., 174, 305, 315 Robbins, W. E., 304, 316 Robertson, A. G., 234, 235 Robertson, I. A. D., 288 Rocha Lima, H. da, 410 Roche, A., 310, 311 Roche, J., 59 Rockstein, M., 304 Rodendorf, B. B., 135, 138 Rodriguez, J. L., 358 Roeder, K. D., 4, 6 Roney, J. N., 369

Rosenfalck, P., 2, 7, 8 Ross, C. R., 393, 394 Ross, H., 228, 231 Roth, L. E., 31 Roth, L. M., 63, 135, 139 Rothenbuhler, W. C., Rothfels, K. H., 73, 79, 135 137 Roulston, W. J., 302, 307 Roussel, J. S., 307 Roys, C. C., 304, 317 Rozeboom, L. E., 135, 137 Rubtsov, I. A., 136, 140, 142 Ruck, P. R., 24 Rumsh, L. T., 141 Ruska, H., 4, 5, 17, 19, 20, 21, 22, 23, 27 Ryasantsev, M. I., 143

S

Saalas, U., 128, 130 Sacktor, B., 13, 14, 303 Saf'yanova, V. M., 144 Sailer, R. I., 142, 144 Saito, T., 196, 200, 201 Sakagami, S. F., 14 Sakami, W., 57 Salzano, F. M., 97, 101 Sanderson, A. R., 74, 79, 80 Sands, W. A., 154, 159 Santa Maria, H. C., 367 Santos, H. L. S., see Souza Santos, H. L. Santos, P. S., see Souza Santos, P. Sato, S., 135, 136 Saunders, L. G., 136 Saure, L., 71 Savage, A. A., 60 Sawaya, P., 17, 19, 20, 21 Sawyer, K. F., 294, 295 Sawyer, K. F., Sayer, H. J., 294, 295 Scaria, K. S., 12 Scattergood, L. W., 247. 248 Schaefer, R. A., 393 Schaerffenberg, B., 136, 141 Scharrer, B. 35, 36, 37, 38, 39, 45, 48 Scharrer, E., 35 Schedl, K., 132 Scheepers, C. C., 248, 254 Schmidt, C. H., 57, 144, 315 Schmidt, E. L., 35 Schmidt, K. P., 244, 245, 247 Schmidt, R. S., 158 Schneidermann, H. A., 317 Schnitzerling, H. J., 302 Scholl, H., 70 Schonbrod, R. C., 56 Schoof, H. F., 313, 315, 380 Schouboe, P. J., 388 Schrader, F., 79, 81 Schrader, G., 354 Schrader, S. H., see Hughes-Schrader, S. Schreiber, K., 206, 208 Schuellein, R. J., 90, 96 Schuh, J. E., 139 Schultz, J., 102 Schumacher, F. X., 243, 245, 253, 255 Schütte, F., 249 Schwerdtfeger, F., 250, 292 Schwinck, I., 63, 196 Scott, A. E., 395 Scudder, G. G. E., 248 Scudder, H. I., 137 Seal, M., 17 Sedar, A. W., 22 Seiler, J., 76 Selander, R., 112, 125 Selens, U. E., 144 Selhime, A. G., 357 Sellier, R., 42 Sergent, E., 416 Sergiev, P. G., 143, 144 Severin, H. C., 176, 177, 178. 180 Severin, H. P., 175, 176, 177, 178, 180, 181, 188 Seydian, B., 416, 417 Seymour, W. G., 285 Shambaugh, G. F., 135, 144 Shapiro, J. E., 29, 57 Sharma, M. I. D., 308 Sharova, I. K., 114 Sharp, D., 113, 115, 116, 123 Sharpe, R. B., 350 Shaw, J., 58, 65 Shear, M. J., 395 Shedley, D. G., 357 Shelden, F. F., 317, 358 Shemanchuk, J. A., 142 Shepard, H. H., 381 Shepardson, E. S., 344 Shewell, G. E., 137 Shiino, A., 306 Shinkaji, N., 357 Shlenova, M. F., 143 Short, J. G., 386 Shotwell, R. L., 289, 290, 292 Shtakel'berg, A. A., 136, 137 Shulov, A., 292 Shumakov, E. M., 289, 290 Shute, P. G., 135, 137 Sidu, A. S., 333 Sikora, H., 405 Silva-Goytia, R., 414 Silver, S. D., 394 Simkover, H. G., 184 Simmonds, H. W., 360 Simmons, S. W., 379, 380

Simpson, G. G., 85 Sinclair, W. B., 358, 363 Singh, H. R., see Harbans Singh, R. Singh, K. R. P., 138, 304 Singh, S., 269 Sites, J. W., 354, 356, 358, 364. 368 Skellam, J. G., 252, 253 Skuhravy, V., 248 Sleeper, D. A., 140 Slifer, E. H., 18 Slinkina, A. G., 143 Sloper, J. C., 38 Smart, J., 136 Smart, M. R., 142 Smirnoff, W. A., 360 Smit, C. J. B., 286, 288, 290 Smith, B., 408, 410 Smith, B. C., 206 Smith, C. N., 144, 405 Smith, D. S., 23 Smith, F. F., 316 Smith, J. N., 301 Smith, L. W., 338, 339 Smith, M. J., see Maynard Smith, J. Smith, M. V., 269, 270 Smith, R. C., 290 Smith, R. S., 394 Smith, S. G., 69-84: 71, 72, 73, 74, 77, 79, 80, 104, 105 Smith, S. M., see Maynard Smith, S. Smith, W. W., 142 Smyth, T., 304, 317 Snedecor, G. W., 255 Snodgrass, R. E., 179 Snow, W. E., 141 Snyder, J. C., 406, 411, 412, 415 Snyder, T. E., 153, 154, 155, 157, 158, 160, 161, 166 Sokoloff, A., 229, 231 Sollmann, T. H., 399 Solly, S. R. B., 314 Solomon, M. E., 135, 143, 219, 229, 250, 288 Somers, E., 346, 347 Sommerman, K. M., 137, 142 Sorensen, E. L., 269 Sotavalta, O., 1 Sotelo, J. R., 30 Southwood, T. R. E., 248 Souza Santos, H. L., 17, 19, 20, 21 Souza Santos, P., 4, 17, 19, 20, 21, 27 Sparrow, H., 411, 415, 416 Spassky, B., 91, 99, 100 Spassky, N., 89, 92

Spector, S., 399 Spencer, E. Y., 301, 313 Spencer, H., 356, 357 Sperlich, D., 89, 102 Spiess, E. B., 88, 89, 90, 91, 93, 94, 96 Spillane, J., 387 Spiller, D., 359 Spinks, J. W. T., 142 Spiro, D., 21 Splinter, W. E., 340 Spurway, H., 91 Staddon, B. W., 58 Stahler, N., 53, 57, 141 Stalker, H. D., 79, 88, 89, 97. 98 Stammer, H. J., 121, 123 Standen, H., 312 Staniland, L. N., 338, 350 Starcke, H., 136 Stark, R. W., 246, 254 Starzyk, J., 415 Stearns, C. R., 355 Stearns, C. R., Jr., 356, 393 Steenberg, K., 350 Stegwee, D., 313 Steinberg, A. G., 102 Steiner, J. O., 234, 236 Steiner, J. G., 234, 236 Steiner, L. F., 172, 175, 226, 360, 361, 362 Steinhaus, E. A., 187 Stephen, W. P., 266 Sternburg, J., 301, 306, 307, 312 Stevens, N. M., 71 Stevens, S. S., 253 Steward, C. C., 136 Stewart, W. S., 356, 358 Stewart, W. S., Steyn, J. J., 359 Stich, H., 66 Stofberg, F. J., 358, 368 Stokinger, H. E., 394 Stone, A., 135, 136, 137, 186 Stone, W., 86 Stone, W. E., 173, 177, 178, 179, 180, 185, 186, 187 Stone, W. S., 69, 102 Stower, W. J., 280, 282, 287 Stralla, D. D., see Deroux-Stralla, D. Strickland, A. H., 244, 250, 254 Stroyan, H. L. G., 206 Stuart, D., 19, 20 Stumm-Zollinger, E., 39, 41, 102 Sturtevant, A. H., 86, 87 Stutinsky, F., 36 Suglyama, S., 200, 201 Sugonjaev, E. S., 355 Sullivan, W. N., 348 Sumerford, W. T., 387 Sundaram, C. V., 173, 175

Sunshine, I., 399 Suomalainen, E., 80 Surtees, G., 141 Suslov, S. P., 135 Swellengrebel, N. H., 408 Swirski, E., 364 Syme, P. D., 137 Symmons, P., 291

#### т

Tahmisian, T. N., 19, 26, 28, 31, 60 Tahori, A. S. 302 Takaku, T., 102 Takenouchi, Y., 80 Tate, P., 175
Tauber, M., 196, 197, 199, 200, 201, 202, 203, 204, 205, 208, 211 Taylor, E. A., 316 Taylor, R. E., 4 Taylor, S. A., 268 Telford, H. S., 270 Telford, T. M., 285 Terriere, L. C., 56 Terrile, B. A., 90 Terzian, L. A., 53, 57, 58. 141 Thielen, W. C., 394 Thienemann, A., 143 Thoday, J. M., 85, 95 Thomas, C., 282, 290 Thomas, I., 86 Thomas, W. D. E., 350 Thompsen, E., 37, 38, 39, 44 Thompson, J. P., 390 Thompson, M. E., 318 Thompson, R. P., 142 Thompson, W. L., 354, 355, 357, 358, 364, 365, 367, 369, 393 Thomson, R. C. M., see Muirhead-Thomson, R. C. Thomson, W. E. F., 234, 235 Thorpe, W. H., 195, 203 Thorsteinson, A. J., 193-218; 196, 197, 199, 200, 201, 202, 203, 204, 205, 207, 208, 211, 212, 214, 215 Tiegs, O. W., 3, 4, 5 Tillyard, R. J., 111 Timmermann, W. A., 409 Tinbergen, L., 249 Ting, P., 130
Tiniakov, G. G., 91, 102
Tixier, M., 59
Toball, R., 206, 208 Todd, F. E., 265-78; 266, 267, 272 Tonelli, P. de P., see Pietri-Tonelli, P. de Torii, K., 208 Torri, T., 252, 253

Toth, L., 59 Tothill, J. D., 248 Townsend, G. F., 269, 270 Townsend, J. I., 99, 100 Toyoda, H., 415, 416 Trapido, H., 309, 310 Travaglino, A., 302 Travis, B. V., 137, 144 Tremaine, M., 135 Trembley, H. L., 138 Trokojus, V. M., 55, 56 Trouvelot, B., 196, 205, Truillo-Cenoz. O., 30 Tsao, Chi, 290 Tsukamoto, M., 308 Tucker, K. W., 272 Tuft, T. O., 272 Tulloch, G. S., 29, 57 Turano, A., 25 Turica, A., 363 Tuzet, O., 71 Twinn, C. R., 135, 137, 140, 143

U

Ueshima, N., 73, 74 Umberger, E. J., 388 Unger, H., 47 Unterstenhöfer, G., 250, 343 Upholt, W. M., 387, 389, 390 Usinger, R. L., 185 Usova, Z. V., 142, 146 Utzinger, G., 144 Uvarov, B. P., 279, 282, 283, 285, 290, 292, 293 Uwo, J. N., see Nishitisutsuji-Uwo, J.

v

Valiela, M. V. F., see Fernandez Valiela, M. V. Vallejo-Freire, A., 4, 20, 21 Vallyathan, N. V., 12 van Asperen, K., see Asperen, K. van Vance, G. H., 393 Van der Kloot, W. G., 35-52; 39, 41, 42 van Emden, F. I., see Emden, F. I. van van Niekerk, O. T., see Niekerk, O. T. van Vansell, G. H., 266, 268, 270 Varley, G. C., 219, 253. 257, 258, 260 Vazquez, L., 37 Venables, D. G., 302 Vergani, A. R., 357, 358 Verholst, H. L., 387, 399 Verschaffelt, E., 194, 205, 212, 214

Vetukhiv, M., 96 Viad. G. B., 371 Vickery, V. R., 269, 270 Villasenor, M. T. B., 37 Virkki, N. E., 72 Vitvitskii, G. N., 135 Vladimirskaia, M. I., 144 Vockeroth, J. R., 136, 137 Vogel, H., 405 Volfson, L. G., 144 von Brand, T., see Brand, T. von von Frisch, K., see Frisch, K. von Von Hofsten, C. G., 316 Von Oettingen, W. F., 399 Von Ohnesorge, B., 247, 257 von Oppenfeld, H., see Oppenfeld, H. von Vorhes, F. A., 388 Vorhies, C. T., 272 Voronin, M. V., 144 Vos, B. J., 388

W

Voss, E., 130

Wadley, F. M., 256 Wahrman, J., 75, 81, 104 Waite, M. B., 265, 276 Wakabayashi, T., 5, 7 Wakeland, C., 288, 290, 292 Wald, A., 246 Walker, K. C., 387, 388, 389, 390, 392, 393, 394, 396 Walker, M. V., 112 Wall, W., 143 Wallace, B., 90, 96, 98 Wallace, G. K., 199 Wallis, R. C., 138, 139, 141, 142 Waloff, N., 248, 249, 283, 288 Waloff, Z., 281, 283, 284, 285, 286, 290, 294 Walstrom, R. J., 268 Walton, G. A., 237 Wampler, E. L., 347 Wang, C. H., 305 Ward, J., 294 Ward, J. C., 381, 382 Wardle, R. A., 197, 205 Watanabe, A., 5 Watanabe, T., 208, 355 Waterhouse, D. F., 56, 62, Waterhouse, F. L., 74 Waters, W. E., 246, 252, 254 Watson, D. L., 143 Watt, K. E. F., 245, 260, 261 Way, M. J., 230

Weaver, N., 272 Webb, F. E., 248, 255 Webster, R. L., 270 Wedding, R. T., 358 Wedgwood, R. J., 399 Weesner, F. M., 153-70; 154, 157, 160, 161, 162, 163, 164, 165, 167, 168 Weiant, E. A., 304 Weidner, H., 158, 159, 160 Weigl, R., 406, 411 Weinman, D., 409 Weinstock, J., 27 Weis-Fogh, T., 2, 3, 7, 8, 12, 287 Wellington, W. G., 201 Werman, R., 6 West, A. S., 142, 145 Weyer, F., 405-20; 36, 405, 406, 407, 409, 410, 411, 412, 413, 414, 415, 416, 417 Wheeler, C. M., 406 Wheeler, M. R., 79 White, E. B., 359 White, M. J. D., 69, 72, 73, 75, 76, 77, 86, 88, 89, 94, 101, 103 Whitehead, V. B., 355 Whiting, P. W., 78 Wiersma, C. A. G., 7 Wiesmann, R., 301, 303, 304 Wigan, L. G., 280 Wigand, R., 409 Wigglesworth, V. B., 18, 23, 35, 38, 40, 41, 45, 56, 57, 138, 213, 214 Wilde, J. de, 194, 195, 199, 206, 212 Wilde, W. H. A., 57 Wille, J. E., 369 Williams, C. M., 13, 37, 39, 40, 41, 42, 45, 142, 281 Williams, M. W., 391 Willis, E. R., 63, 135, 139 Wilsie, C. P., 268 Wilson, D. B., see Bagster-Wilson, D. Wilson, E. O., 230, 238 Wilson, H. G., 313, 316 Windish, J. P., 393, 394 Winsche, W. E., 338, 339 Winteringham, F. P. W., 301, 311, 316, 319 Winton, M. Y., 314 Wirth, W. W., 136 Wishart, G., 139 Witherspoon, J. P., 141 Witt, J. M., 305, 307 Woglum, R. S., 358 Woke, P. A., 316 Wolbarsht, M. L., 18, 206 Wolf, B. E., 72

Wolf, E., 87
Wolf, J. P., III, 55, 56
Wolfe, H. R., 392, 296
Wolfe, L. S., 135, 142
Wolken, J. J., 25
Wolman, B., 415, 416
Wolman, M., 415, 416
Woodroffe, G. E., 79, 80
Woodrow, A. W., 266, 272
Woods, W. C., 175, 183
Woodward, T. E., 414
Worthy, W. L., 358, 369
Wright, E. N., 285
Wright, J. W., 306
Wright, R. H., 144

Wright, S., 76, 88, 91, 94

197

Yagi, T., 355
Yakabu, V. N., 143
Yakhimovich, L. A., 289
Yamafuji, K., 66
Yamasaki, T., 311, 313
Yashika, K., 38
Yasutomi, K., 306
Yasuzumi, G., 31, 32
Yeo, D., 285, 336, 344
Yoshihara, F., 66
Yosida, T. H., 73
Yothers, W. W., 175, 358, 364
Young, V. D., 335
Younga, S. E., see
Endrödy-Younga, S.
Yuasa, H., 125

Yule, W. N., 295

Zakharov, L. Z., 290 Zanardini, I. F., 103 Zebe, E., 12, 13, 14 Zeid, M. M. I., 316 Zeuner, F., 111, 112 Zeutschel, B., 25 Zimin, L. S., 137 Zimmering, S., 102 Zinsser, H., 414 Zollinger, E. S., see Stumm-Zollinger, E. Zolotarevsky, B., 282 Zulueta, J. de, 309, 310

Zwickey, R. E., 388

Yunus, C. M., 370 Yust, H. R., 317, 358

### SUBJECT INDEX

1

Abundance and distribution of insects, 219-41 Acanthoceridae, 120 Aceria sheldoni (citrus bud mite), 367 Acheta domestica, 61, 62 Acrida bicolor, 62 Acrididae, 75, 285, 290, 292 Acromyrmex, 369 Actea, 113 Activity rhythms, 44 Acyrthosiphon spartii, 206 Acyrthosiphum pisum, see Microsiphum pisi Adaptation chromosomal variation and, 85-110 Adelges piceae, 245 Adephaga, 111, 112, 113-14, 121, 126 Adoxus obscurus, 80 Aedes aegypti artificial insemination in, 139 DDT resistance of, 308 excretion of, 53 hormone influence of, 139 neurosecretion of, 45 nitrogen metabolism in. 57-58 physiology of, 64 population density of, 141 temperature effect on flight of, 141 Aedes campestris, 139 Aedes communis, 139, 141 Aedes excrucians, 141 Aedes flavescens, 142 Aedes hexodontus, 139, 141 Aedes impiger, 141 Aedes nigripes, 141 Aedes nigromaculis, 308 Aedes punctodes, 141 Aedes punctor, 141 Aedes taeniorhynchus, 308 Aerodynamic force, 1, 2 Aglycyderidae, 131 Agriotes mancus, 72 Agromyzidae, 87 Agyrtini, 119 Aldrin, 274, 310 Aleurocanthus woglumi, Aleurothrixus floccosus, 369 Allethrin, 274

Allocorynus, 131

Ameles, 81

Altica chalybea, 71

Ameles cypria, 104 Ameles heldreichi, 104 American cockroach, see Periplaneta americana Amitermes, 155, 157, 160 Amitermes excellens, 157 Amitermes wheeleri, 157, 160, 164, 165 Amitermitinae, 154, 155, 157 Amphizoa, 114 Amphizoidae, 114 Anacanthotermes, 155 Anagaster kühniella (Mediterranean flour moth), 40 Anarsia lineatella, 317 Anastrepha, 172, 177 Anastrepha acidusa, 186 Anastrepha fraterculus (South American fruit fly), 80, 185-86 Anastrepha ludens (Mexican fruit fly), 362 insecticide for, 187 irradiation of, 362 life history of, 172, 173, 174 egg laying, 176, 185 larva, 177 pupa, 178, 179 movement of, 188 races of, 186 Anastrepha mombinpraeoptans, 185, 186, 187 Anastrepha serpentina, 185 Anastrepha striata, 187, 189 Anastrepha suspensa, 186 Angelica root oil, 362 Anischia, 122 Anisopus cinctus, 72 Anisotarus cupripennis, 43, 48 Anisotomidae, 119 Annulata, 137 Anobiidae, 124, 129 Anoeme, 129 Anopheles, 310 Anopheles albimanus, 309-10 Anopheles algeriensis, 142 Anopheles atroparvus, 309-

host seeking of, 139 nitrogen metabolism in. 58 population density of, 141 respiration of larvae of. 138 Anopheles sacharovi, 309-10 Anopheles stephensi, 138, 309 Anopheles sundaicus, 309 Anopheles vexans, 142 Anoploderminae, 128, 129 Anoplolepis longipes, 230 Anoplotermes, 154, 162, 166 Anoplura, 405-20 Anorus, 119 Ant ecology of, 228-31 honey-dew producing insects and, 368 Anthereae pernyi, 42 Anthonomus grandis (boll weevil), 307 Anthribidae, 130 Aonidiella aurantii (California red scale) control of, 354, 357, 358 cyanide resistance of, 317 distribution of, 359 life cycle studies of, 360 Aonidiella citrina (yellow scale), 354, 357 Aphid BHC control of, 338 on citrus, 367 excretory substances of, 54-57 food-plant perception of. 195 organophosphorus insecticide and, 313 see also specific names Aphidae, 3 Aphis citricidus (black citrus aphid), 368 Aphis gossypii (melon aphid), 368 Aphis pomi (apple aphid), 56 Aphodius howitti ecology of, 221-25 Apicotermes, 158, 159 Apicotermitinae, 158 Apionidae, 129, 131, 132 Apis dorsata, 265-66 Apis florea, 265-66 Apis indica, 265-66 Apis mellifera (honey bee) malpighian tubes of, 61-62 muscle fibers of, 21

Anopheles gambiae, 311

Anopheles labranchiae, 309-

Anopheles maculipennis, 76, 142, 309

Anopheles quadrimaculatus

ecology of, 141

DDT susceptibility of, 309

10

10

neurosecretion in, 36 water metabolism of, 44 OP insecticide resistance of. 314 parthenogenesis in, 78 in production of crops. 263-78 directing of, 268 drifting of, 271-72 foraging areas of, 269 moving colonies of, 270 number of colonies of, 266 placement patterns of, 268-69 poisoning of, 272-75 pollen dispensing of, 269-70 strength of colonies of, 266-68 temperature and, 270-71 water needs of, 270-71 Apocrita, 125 Aramite, 274, 366, 367 Archangelica, 362 Archostemata, 111, 112, 114, 126 Argyrotaenia citrana, 370 Argyrotaenia velutinana (red-banded leaf roller). 306-7 Arrhinotermitinae, 154 Arsenic, 317-18, 386 Arvelius albopunctatus, 81 Ascobacterium luteum, 187 Aseminae, 128, 129 Atimiini, 128 Atractocerus, 125 Atta, 369 Attelabidae, 129, 131 Aulacoscelinae line, 129 Austroicetes, 75

#### P

Bacteria, 405, 407, 408, 410 Balginae, 122 Barathra brassicae (cabbage cutworm), 306 Bartonellae, 409 Bedbug, 316 insecticide resistance of, 316 see also specific names Bee. 202 see also specific names Belidae, 131 Belostoma, 13 Bemisia gossypiperda, 342 Benzene hexachloride, 379 BHC amount produced, 382 control by of aphid, 338 of biting fly, 144 Drosophila resistance to,

effect on honey bees, 274 mode of action lipoid barrier, 303 resistance to, 312-13 y-BHC, 295, 360 Bibionidae, 87 Biological control of weeds. 227-28 Biology of biting flies, 140-43 of termites, 153-70 Biphyllidae, 127 Biphyllus, 127 Biting fly, see Fly, biting Blaberus discoidalis, 70, 76 Blaps, 73 Blaps gibba, 62 Blaptinae, 73 Blatta orientalis (oriental roach), 61 malpighian tubes of, 61 Blattella, 311 Blattella germanica, 63, 305 Blattidae, 3, 12, 63 Blowfly, 14 Bombus, 8, 10, 11, 61 Bombyx mori (silkworm) DDT susceptibility of, 307 food-plant perception of chemotactic classification of, 210 patterns of, 308 neurosecretory cells of, 37-38 growth and, 41 molting and, 40 peritrophic membrane of, sucrose need of, 203 Boophilus decoloratus, 318 Boophilus microplus, 307, 317 Bordeaux mixture, 274, 346 Bostrychidae, 129 Bostrychiformia, 116, 123-24 Bostrychoidea, 116, 123, 124, 126 Brachycera, 37 Brachymera, 123 Brachypsectra, 122 Brain color changes and, 42-43 molting and, 38-42 Brenthidae, 131-32 Brevicoryne brassicae (cabbage aphid), 54, 59 Brevipalpis lewisi, 367 Brevipalpus obovatus, 367 Brounia, 122 Bruchela, 130 Bruchidae, 129

Bumble bee, see Bombus

Buprestidae, 122

Buprestoidea, 121

Byrrhidae, 121, 123 Byrrhoidea, 121 Byturidae, 127 Byturus, 127

C

Cactoblastis cactorum, 228 Calcium arsenate, 274 California red scale, see Aonidiella aurantii Calliphora erythrocephala, 39, 44, 63 Callirhipidae, 122 Callitroga hominivorax, 225-26 Camirinae, 119 Camnula pellucida, 202-3, 204-6 Camptosomata, 129 Cantharoidea, 121, 122, 124 Captan, 274, 344 Carabidae, 114, 116 Caraboidea, 113, 122 Carabus nemoralis, 43 Carausius morosus activity rhythm of, 46 color changes of, 43 egg formation of, 45 excretory products of, 56 hormone chemistry of, 40 malpighian tubes of, 61 neurosecretory cells of, 37, 38 nervous system extracts of, 46, 47 nitrogen metabolism of, 59 physiology of, 64-66 Carpocapsa pomonella (codling moth), 228, 317 Catenary theory, 213-15 Catopinae, 119 Catopocerus, 119 Cecidomyidae, 87 Cecropia moth, see Hvalophora cecropia Cephidae, 125 Cephus cinctus, 42 Cerambycidae, 128, 129, 130 Ceratitis, 172 Ceratitis capitata (Mediterranean fruit fly) biology of, 363-64 climatic effect on, 362 competition of, 189-90 control of, 360, 362, 364 eradication of, 187 insecticide for, 187 life history of, 173, 174, 176, 178, 180 movement of, 188, 189 Cercopididae, 3, 4 Cerophytum, 122 Ceroplastes, 56

Ceroplastes destructor (white

wax scale), 357 Ceroplastes rubens, 357 Cerylonidae, 127 Chaetosomatidae, 126 Chamaemyia polystigma, 79 Chamaemyiidae, 79 Chelonariidae, 121 Chemotropism, 361 Chilenius, 124 Chilocorini, 75, 77 Chilocorus hexacyclus, 72, 77, 81 Chilocorus orbus, 77 Chilocorus stigma chromosomal polymorphism of, 74, 75, 81, 104-5 meiosis in, 77 sex-determining mechanisms of, 72, 73 Chilocorus tricyclus, 72, 77 Chilo suppressalis (rice stem borer), 42, 201 Chironomidae, 87 Chironomus, 87, 98 Chironomus annularius, 73 Chironomus dorsalis, 89 Chironomus tentans, 73, 75, 87. 89 Chalamisinae, 129 Chlorbenside, 274 Chlordane benefits to health by, 379 control by of ant, 368 of fruit fly, 364 effect on honey bees, 274, house fly susceptibility to, 310 Chlorobenzide, 366 Chlorobenzilate, 274, 364, 367 Chlorthion, 274, 313, 392 Choristoneura fumiferana (spruce budworm), 201 edaphic factors and, 256 sampling design of, 244, 248, 249, 255 Choristoneura pinus, 203 Chorthippus, 205 Chorthippus longicornis, 203 Chortoicetes terminifera (Australian plague locust) control of, 294 outbreak areas of, 283 outbreaks of, 292 phases of, 279-80 Chromosome adaptation of, 85-110 mechanics of, 69-72 polymorphism of, 73-76 individual adaptability and, 86-96 population adaptability and, 96-105 variation of, 85-110 Chrysolina quadrigemina, 228 Chrysomela gemellata, 228

Chrysomela hyperici, 228 Chrysomeloidea, 124, 125, 126, 128-30 Chrysomphalus aonidum (Florida red scale), 354, 357, 359 Chrysomphalus dictyospermi (dictyospermum scale), 355, 360 Cicada, 21, 22 Cicada tibicen, 5 Cicadellidae, 3 Cicindellidae, 73 Cimberis, 130 Circottetix, 103 Circotettix undulatus, 103 Cisidae, 123, 127 Citrus and fruit fly as pest, 360-64 insects, 353-78 mites, 364-67 scale insects, 353-60 Citrus natsudaidai, 359 Clambidae, 115, 116, 118 Classification see Coleoptera, phylogeny of; Taxonomy Clavicornia, 115, 123, 127 Clepsis peritana, 370 Cleridae, 124, 216 Cleriodea, 124, 125, 126, 128 Climate effect of on Aphodius howitti. 222-25 on fruit fly, 362-63 on Oncopera fasciculata, 220-21 Clytrinae, 129 Cnephia mutata, 79 Coarctotermes tenebricus. 154 Coccinellidae, 72, 127 Coccinia indica, 173 Coccoidea, 54 Coccus hesperidum (soft scale), 55, 56, 356, 357, 360 Coccus pseudomagnoliarum (citricola scale), 55, 354, 357 Cockroach, 5, 20, 21, 23, 26 see also specific names Codling moth, see Carpocapsa pomonella Coleoptera chromosomal polymorphism of, 86 cytogenetics of, 69-84 DDT susceptibility of, 307 flight muscle of, 3 excitation of, 7 metabolism of, 12

origin of, 111-12

Cucujiformia, 124-32 Elateriformia, 115, 116, 117, 120-23 Scarabaeiformia, 119-23 Staphyliniformia, 117-19 position of Stylopoidea in, 112-23 suborders of, 111-12 Collembola, 71 Colleterial gland, 30 Coloninae, 119 Colorado potato beetle, see Leptinotarsa decemlineata Color changes, 43-44 Colydiidae, 123, 127 Constrictotermes, 158, 160 Constrictotermes cavifrons, 154 Copper sulfate, 274 Coptocera, 119 Coptotermes, 155 Coptotermes acinaciformis, 160 Coptotermes formosanus, 157 Coptoter mitinae, 153 Coretha, 47 Cornitermes cumulans, 159 Corydalis, 111 Corylophidae, 127 Corythucha ciliata, 231 Crustacea, 36 Crvolite, 274 Cryptocephalinae, 129 Cryptocercus, 153 Cryptonephridies, 115 Cryptostemma calendulaceum, 222, 223 Cryptotermes, 155, 157 Cubitermes, 167 Cubitermes finitimus, 158, 160 Cucujidae, 127 Cucujiformia, 115, 121, 124-32 Cucujoidea, 118, 123, 124, 125, 126-28 Cuculionoidea, 125, 126 Culex, 72 Culex fatigans, 308 Culex molestus, 138, 139 Culex pipiens, 58, 137, 139 Culex pipiens molestus, 309 Culex quinquefasciatus, 308 Culicidae, 87, 135 Culicoides, 136, 140, 143, 144 Culicoides circumscriptus, 138 Culicoides impunctatus, 140 Culiseta alaskaensis, 143 Culiseta impatiens, 140 Culiseta morsitans, 141-42 Cunilate, 274 Cupedidae, 111, 115

phylogeny of, 111-34

Cupes, 116 Cuprous oxide, 274 Curculionidae, 80 Curculionoidea, 124, 130-Cuticle, 17-18 Cyanide, 317 Cylas, 131 Cytogenetics chromosome mechanics. 69-72 chromosomal polymorphism, 73-76 DNA, 80-82 hybrid meiosis, 76-78 parthenogenesis, 78-80 pseudopolyploidy, 80-82 sex-determining mechanics.

D

Dacus, 171-72 Dacus brevistylus, 176 Dacus cucurbitae (melon fly). 362 climatic influence on, 362 life history of, 173, 174, 176, 180 larva, 177, 178 oviposition, 176 pupation, 179 Dacus dorsalis (oriental fruit fly) climatic effect on, 362 competition of, 189-90 control of, 361, 362, 364 food requirements of, 360 fumigants for, 363 life histroy of, 172, 173, 174, 175, 176, 181 movement of, 187, 188 radiation influence on, 226 Dacus oleae (olive fly), 181, 187 Dacus tryoni (Queensland fruit fly), 176, 181, 183 competition of, 189 geographic races of, 239radiation influence on, 226 Dacus tryoni neohumeralis, 240-41 DANP. 306 Dascillidae, 116 Dascilliformia, 120 Dascilloidea, 119, 120, 121, 123 Dascillus, 119, 120 Dasyceridae, 119 DDT amount produced, 381, 382 benefits to health by, 379-81

control by

SUBJECT INDEX of ant. 369 of beetles, 370 of biting fly, 144 of citrus mite, 365 of Empoasca lybica, 342 of fruit fly, 364 of Lepidoptera, 370 -dehydrochlorinase resistance to, 301-3 effect on honey bees, 272 excretion in house fly, 57 fat storage and, 389, 390 house fly resistance to, 315, 316, 318 illness caused by. 395 mode of action, 303 chemical, 304 lipoid barrier, 303-4 sensitivity of nerve, 304 protective clothing against, 392 resistance to, 301-10 skin absorption of, 391 toxicity and safety of, 388, 389 DDVP, 274 Dehydrochlorinase, 301-2 Delnav, 274 Delphacidae, 3 Demeton, 274, 366, 367 Density-dependent definition of, 219 Dermaptera, 37 Dermestes, 123 Dermestidae, 116, 123, 124 Dermistoidea, 116 Derodontidae, 116, 123, 125 Derodontus, 123 Desert locust, see Schistocerca gregaria Diamondback moth, see Plutella maculipennis Diapause egg, 45-46 of fruit fly, 179-83 and hormone release, 42 Diaphora citri, 370 Diazinon benefits to health by, 379, 380 control by of citrus mite, 364 of citrus psylla, 370 of fruit fly, 364 of locusts, 295 effect on honey bees, 274 house fly resistance to, 313, 315 mode of action lipoid barrier, 303 Dibrom, 274 Dicapthon, 274 Dicranomyia trinotata, 87 Dieldrin benefits to health, 379 control by

of ant, 368

of fruit fly, 364 of locusts, 295 effect of on Blattella germanica. 305 on honey bees, 274 on Periplaneta americana, 304-5 house fly susceptibility to, 310-12 mode of action, 311 lipoid barrier, 313 resistance mechanisms to. 311 toxicity of, 396 safety and, 388 Diglochis occidentalis, 143 Dilan, 274 Dimetox, 390 Dimite, 274 Dinitro ortho-cresol, 392 Dinitrophenol, 390 Diontolobus, 126 Diprion frutetorum, 79 Diprion hercyniae, 247 Diprion similis, 79 Diptera biting, 135-52 brain and moling of, 40 chromosomal polymorphism in. 86 inversion distribution of, 98 mechanics of, 69, 71 flight muscle of, excitation, 6, 7 mechanical properties of, metabolism of, 11, 12 structure of. 3 innervation of, 5 neurosecretory cells of, 37 northern biting flies, 135-52 organophosphorus insecticides and, 313 parthenogenesis by, 79 Dipterex, 274, 313, 315 Discolomidae, 127 Dissosteira longipennis, 290 Distantiella collarti, 369 Distenia, 128 Disteniinae, 128, 129 Distribution and abundance of insects, 219-41 Di-Syston, 274 Dixippus, 26 Dixippus morosus, see Carausius morosus DN-111, 366 DNA, 81 DNOC, 392 DNOSBP, 274 Dociostaurus maroccanus, 279 Donus crinitus, 62 Dorsal vessel, 26

310

Environment

theory of, 219

Eneoptera surinamensis, 75

Eotetranychus banksi (Texas

Dragonfly, 20, 21, 24 see also specific names Drapetes, 122 Drepanotermes, 158 Drilidae, 122 Drosophila chromosome of, 75, 76 compound eye of, 24-25 DDT susceptibility of, 307-8 dieldrin effect on, 311 ecology of, 229, 231-32 natural selection by, 98 salivary gland of, 26-27 spermatogenesis in, 32 see also specific names Drosophila algonquin, 87 Drosophila ananassae, 87, Drosophila equinoxialis, 100 Drosophila funebris, 91, 102-3 Drosophila insularis, 100 Drosophila mangabeirai, 79 Drosophila melanogaster, 102 central nervous system of, 22 chromosomal polymorphism in, 103 DDT resistance of, 307-8, 319 malpighian tubes in, 63 Drosophila miranda, 231-32 Drosophila parthenogenetica, Drosophila persimilis, 88, 89, 93, 94, 96, ecology of, 231-32 geographic races of, 240 Drosophila pseudoobscura, chromosomal variation in, 88 95 adaptive values of, 93, 94 physiological properties and, 89, 90, 81, 92, 96 population adaptability and, 96-99, 102 population variation and, viability and, 91, 92 ecology of, 231-32 geographic races of, 240 Drosophila robusta chromosomal variation in, 87, 88, 93, 98, 101 Drosophila subobscura, 102 Drosophila tropicalis, 100 Drosophila willistoni, 93, 94 chromosomal variation in, 99-102 ecology of, 232 Drosophilidae, 87 Drug store beetle, see Stegobium paniceum Dryopoidea, 113, 121

SUBJECT INDEX Dysdercus keenigii, 73 citrus mite), 367 Dysdercus mendesi, 73 Eotetranychus orientalis Dytiscidae, 114 (oriental citrus mite), Dytiscidae-Complicati, 113, Eotetranychus sexmaculatus 114 (six-spotted mite), 234, Dystiscus, 64 367 Eoxenos, 125 Ephemeroptera, 4, 37 Epidermis, 19 Earias, 342 Ecology, 140, 143 Epilachna varivestis (Mexof biting flies, 140-43 ican bean beetle), 307 of Oncopera fasciculata, Epilampra verticalis, 70 EPN, 274, 366 220 population Epochra, 172 adaptability of, 96-105 Epochra canadensis (currant genetical aspects of, fruit fly), 175, 177, 178, 237-41 181 Erebia, 81 Egg diapause, 45-46 Erebus, 25 formation, 45 Erichsonia, 129 Ericmodes, 128 laving of Aphodius howitti, Eriosoma lanigerum (woolly 222-23 apple aphid), 56 Erirrhinini, 132 capacity for, 90, 96 Erotylidae, 127 forecasting number of locusts, 289 Erythroneura, 231 of fruit fly, 175, 176, Ethion, 274 177 Euaesthetinae, 119 of locusts, 286, 288 Euchilotermes, 167 of mosquitoes, 139 Eucinetidae, 116 and olfactory stimuli. Eucinetoidea, 116 Eucinetus, 125 201 Eucnemidae, 122 of Oncopera fasciculata, 220-21 Eucosma griseana, 255 Eucrada, 124 Euderia, 124 and tactile stimuli, 198 puncturing fruit fly competition in, Euhamitermes, 154 Euleia, 172 Euleia heraclei (celery fly), Elateriformia, 115, 116, 117, 120-23 175, 181 Elateroidea, 121, 122 Eulichas, 121, 122 Electron microscope, 4 Eumolpinae, 129 Eurhynchini, 131, 132 Elmidae, 121 Empelus, 118 European cabbage worm, see Pieris brassicae Empoasca decadans, 369 Empoasca fabae, 369 European corn borer, see Pyrausta nubilalis Empoasca lybica, 342 Eurypogonidae, 121, 122 Empoasca solana, 369 Endomychidae, 127 Eurytermes, 154 Euscirtus hemelytrus, 73 Endopterygota, 111 Endothal, 274 Euthochtha galeator, 369 Endrin Evolution control by of biting flies, 135-40 of ant, 368 chromosomal adaptation to, 85-110 of citrus psylla, 370 of sugar-cane stem borer, of chromosome systems. 333, 334 72 and DNA, 81 effect on honey bees, 274 flour contamination with, in fire ant, 238 in fruit fly, 240 395 house fly susceptibility to, of fusion-fission polymor-

phism, 75

Excretion

of male haploidy, 79 of termites, 153-70

see also Phylogeny

H

mechanism of, 63-66 physiology of, 53-68 products of, 53-57 Exochomus, 75 Eye, 24-25

F

Fecundity requirements of Dacus, 173 variation, 90, 97 Filariae, 407 Flight requirements, 1 Fly biting behavior of, 138-40 biology of, 140-43 control of, 143-45 economic importance of, 143-45 evolution of, 135-40 morphology of, 135-40 physiology of, 138-40 northern, 135-52 systematics of, 135-40 black, 136 chromosome studies of, 137 ecology of, 142 physiology of, 140 biology of, 171-92 on citrus, 360-64 competition in, 189-90 diapause in, 179-83 life history of, 172-79 lures for, 362 movement of, 187-89 parasitism in, 186-87 races of, 183-86, 239-41 symbiotes in, 186-87 house BHC resistance of, 312-13 control of, 379 DDT resistance of, 301-4 OP insecticide resistance of, 313-15 Prolan susceptibility of, 310 pyrethrin resistance of, 316-17 sucrose response of, 202 tabanid, 138 population studies of, 143 tsetse ecology of, 234-37

extermination of, 227

effect on insect survival,

Food-plant perception, see

Host selection

Fruit fly, see Fly, fruit

Food

226-28

G

Galleria mellonella (wax moth), 61, 63 Gammexane, 368 Gaglia, 22-24 Gasterophilus, 317 Gastroidea viridula, 205 Gause's law, 229 Geadephaga, 113-14 Gelastorrhinus, 32 Genecerus, 119 Genetics chromosome adaptation, 85-110 variation, 85-110 DDT resistance and, 302, 308 plant resistance and, 215 population ecology, 237-41 of Rhagoletis pomonella, 183-86 variability in food-plant selection, 207 see also Cytogenetics Genite, 274 Geotrupidae, 120 German cockroach, see Blattella germanica Glaphyrinae, 120 Glaresis, 120 Glossina morsitans, 227, 234-35 Glossina morsitans submorsitans, 234 Glossina pallidipes, 227 Glossina palpalis, 236 Glossina swynnertoni, 227, 235-36 Glossina tachinoides, 236 Glyptotendipes barbipes, 75, 76 Glyptotermes, 155, 157 Gnathamitermes, 157 Gnathamitermes perplexus, 160, 164, 165 Golgi complex, 22, 30, 31 Gonyleptidae, 30 Grallatotermes, 160 Grasshopper chromosomal variation in, 101, 102 Malphighian tube of, 28-29 morabine, 73 sorghum resistance to. 203 see also specific names Gryllus campestris, 42 Gryllus domesticus, see Acheta domestica Gryopus ovalis, 70, 71 Gut, 26-27. 66 Guthion, 274, 364, 388 Gymnetron, 132 Gyrinidae, 113, 114

Habrobracon, 75 Haematopinus suis, 70, 71, 406, 414 Haematopota, 143 Haemoproteus, 140 Halipidae, 114 Haplogastra, 112 HCN, 317, 353-54, 358 Hedobia, 124 Heleidae, 135, 136, 143 Heliothis, 342 Helodidae, 116 Helophorus, 117 Hemerocampa vestusta (western tussock moth), Hemiptera, 3, 37, 40, 70 Hemotocyte, 40 Hendecatomus, 124, 126 Heptachlor, 274, 310 Heteragastra, 112 Heteroceridae, 121 Heteromera, 115, 127, 128 Heteroptera, 70-73, 86 Heterotermes, 155 Histeridae, 122 Histeroidea, 117-18 Hodotermes, 155, 156, 160, 162 Hodotermitidae, 153, 155 Hodotermitinae, 156, 157, 165 Homolisidae, 122 Homoptera brochosomes of, 57 chromosomal variants in. chromosome mechanics of, 69, 70 flight muscles of, 3, 4 innervation of, 5 neurosecretory cells of, Honey bee, see Apis mellifera Honey bees in crop production, 263-78 Hornworm, 26 Hospitalitermes, 160 Host-plant selection, see Host selection Host selection in phytophagous insects, 193-218 plant resistance to insects, 215-16 antecedent theories of, 210 catenary theory of, 213-15 chemotactic classification of, 209 chemotactic stimuli, 200 food-plant finding, 195

food-plant perception, 195

food-plant recognition, 198 genetic variability, 207 gustatory stimuli, 202-7 olfactory stimuli, 200-2 patterns of, 207-10 visual stimuli, 199 House fly, see Fly, house Humidity bacterial survival in lice and. 408 citrus mite rearing and, 366 fruit fly movement and, 189 gradients in spruce budworm, 201 see also Moisture Hyalophora cecropia (cecropia moth), 36, 39, 40, 45 Hybosoridae, 120 Hybrid, 76-78 Hydnobius, 119 Hydradephaga, 113-14 Hydraenidae, 117, 123 Hydrophilidae, 122 Hydrophiloidea, 113, 117 Hydroscapha, 116 Hydroscaphidae, 111 Hygrobia, 114 Hylastinae, 132 Hylotrupes bajalus (house longhorn beetle), 203 Hymenoptera chromosomal polymorphism in, 74

comparision Cucujiformia, 125
flight muscle of, 3
excitation, 6, 7
mechanical properties of, 8
metabolism of, 11, 12
neurosecretory cells of, 37
nitrogen metabolism of, 59
parthenogenesis in, 78, 79

Hyperaspis billoti, 71

Hypericum perforatum, 228

Icerya purchasi (cottony cushion scale), 55, 354, 357
Insecticides alkali bromides, 318 aspects of application of, 327-52 analysis of, 333-48 availability, 327-28 comparison of methods, 328-31 experimental methods, 348-50 landing, 338-41

persistence, 346-48 recovery, 336-38 retention, 346-48 run-off, 346-48 selection methods, 332-33 uniformity, 341-46 bromomalonates, 318 effect on honey bees, 274 mechanisms of resistance to, 301-26 DDT, 301-10 organophosphorus, 313-16 toxicity of, 391 see also Pesticides Insemination, artificial, 139 Intestine, 26-27 see also Gut IPC, 274 Iphita limbata, 44, 48 Iridomyrmex humilis (argentine ant), 230 Isagoras schraderi, 72

(argentine ant), 230 Isagoras schraderi, 72 Isochaeta, 113 Isodrin, 274 Isolan, 366

Isolan, 366 Isoptera, 154 Ithycerus, 131, 132 Ixodes ricinus, 227

J Jacobsoniidae, 123 Jassidae, 3

K

Kalotermes, 155, 157, 162, 165, 166 165, 166 Kalotermes flavicollis, 45, 162, 163, 164, 166 Kalotermitidae evolution and biology of, 153, 155, 156, 157, 162, 165 Karathane, 274 Karumiidae, 122 Keithane, 274, 366-67 Krebs-Henselet cycle, 58

.

Lacessititermes, 160
Lamellicornia, 116
Lamiinae, 128, 129
Lamprosominae, 129
Large milkweed bug, see
Oncopeltus fasciatus
Laricobius, 123
Lathridiidae, 127
Lead, 387
Lead arsenate, 274
Leafhopper, 203
ecology of, 228, 231
Malpighian tubes of, 28-29
Lepiceridae, 111
Lepidoptera
chromosome mechanics, 70

flight muscle of, 4
metabolism of, 12
neurosecretory cells of, 37
nitrogen metabolism of, 58
Oncopera fasciculata, 22021
Lepidosaphes beckli (purple

scale), 354, 357, 359, 360 Lepidosaphes gloverii (Glover scale), 360

Leptidea, 81
Leptinidae, 119
Leptinotarsa decemlineata
(Colorado potato beetle)
food plant perception of,

195, 196, 202, 212 chemotactic classification, 209 olfactory stimuli, 200 patterns of, 208 gustatory stimuli of, 203,

gustatory stimuli of, 203, 204, 205, 206 Leptoglossus gonagra, 369 Leptoglossus phyllopus, 369 Lepturinae, 128, 129 Leucaspis japonica, 360 Leucophaea maderae (Madeira roach), 38,

45, 46, 57, 305-6 Lice bacteria and, 405, 408 bartonellae and, 409 biological relationship and microbial agents of, 405-20

disease transmission and, 405, 407 filariae and, 407 Rickettsiae and, 410-15 spirochetes and, 415-18 see also specific names Light, 138, 141 Light organ, 29-30 Lymichides, 121

Limnichidae, 121 Limonidae, 87 Limulodidae, 118 Lindane benefits to health by, 379 control by

of fruit fly, 364
effect on honey bees, 274
incidental exposure to, 393
toxicity and safety of, 388
Liodini, 120
Liophloeus tessulatus, 80
Listroderes costirostris

Listroderes costirostris obliquus (vegetable weevil), 80, 201 Liturgousa, 81 Locust

control of, 292
biological background of,
279-300
forecasting infestations of,
289-92
migration of, 284-85

outbreak areas of, 281-84 phases of, 279-81 population dynamics of, 285-89 see also specific names Locusta, 288 Locusta migratoria, 64, 282, 284 Locusta migratoria manilensis, 290 Locusta migratoria migratoria, 282, 290 Locusta migratoria migratoroides inherited factors in, 280 migration of, 287-88 outbreak areas of, 282, 284 Lonchoptera dubia, 79 Lucanidae, 120 Lucilia caesar, 37 Lucilia cuprina, 62, 66, 231 Luffia lapidella, 80 Lycidae, 122 Lycosidae, 30 Lyctidae, 124 Lymexylidae, 123 Lymexyloidea, 125, 126

# M Macrotermes carbonarius,

Macrotermitinae, 155, 158-

Malacodermata, 115, 124

Malacosoma americanum.

Malacosoma castrensis, 104

benefits to health by, 379,

159

59, 167

Malacosoma, 26

307

380

Malathion

Maculipennia, 309 Magicicada septemdecim, 5

control by of fruit fly, 361, 364 of scale insect, 356-57 dermal exposure to, 392 effect on honey bees, 274 house fly susceptibility to, 313-15 toxicity of, 390 Maleuterpes spinipes (Dicky rice weevil), 370 Malpighian tubes of Bostrychiformia, 123 for classification, 117, 119 in Cuculiformia series. 124 in Elateriformia series, 121 excretion of insecticides, 57 excretory products of, 56 of grasshopper, 26, 28-29

neurosecretion and, 46 nitrogen metabolism in, 59 physiology of, 65 of Polyphaga, 115, 116 products of, 53 structure of, 60-63 water metabolism of, 43-44 Maneb, 274 Mansonia perturbans, 141 Mantidae, 3 Mantis religiosa, 62, 70, 76 Mastotermes, 153 Mastotermes darwiniensis, 155, 156 Mastotermitidae, 153, 155 MCP, 274 Mecinus, 132 Mecoptera, 4, 40, 72 Mediterranean flour moth, see Anagaster kühniella Megalopodinae, 129, 130 Megaloptera, 111, 116 Megascelinae, 129 Meiosis, 76-78, 87-88 Melanoplus, 13, 281, 288, 289 Melanoplus differentialis, 22, 26, 60, 306 gut studies of, 26 thoracic gland of, 22 Melanoplus femur-rubrum, 306 Melanoplus mexicanus, 290 Melanoplus spretus (Rocky Mountain locust), 279, 281-83 Melia azedarack, 193 Melitaea cinxia, 104 Meloidae, 112, 124 Melyridae, 124, 126 Membracidae, 3 Mengenilla, 125 Merophysiidae, 127 Metabolism of flight muscles, 11-14 of nitrogen, 57-60 of water, 43-44 Metacide, 274, 360 Metamorphosis, 38-42, 66, 140 Methoxychlor, 274, 306, 364 Methyl demeton, 274 Methyl parathion, 388 Microcerotermes, 154, 155, 158, 167 Microcerotermitinae, 154 Microhodotermes, 155 Micromalthidae, 111 Micromalthus debilis, 80, 112, 116 Micromorphology, 17-34 compound eye, 24-25 cuticle, 17-18 dorsal vessel, 26 epidermis, 19

intestine, 26-27

light organ, 29-30 muscle, 20-21 myochiten junctions, 20 neuromuscular junctions, 22 ocellus, 24 peripheral nerves, 21 peritrophic membrane, 27 reproductive system, 30-32 salivary gland, 26-27 sensilla, 18 tracheal system, 18-19 Micropeplidae, 119 Microsilpha, 119 Microsiphum pisi, 54, 59 Microtermes, 156 Migratory locust, see Locusta migratoria Mimastiliae, 42 Mite, 144, 364-67 Mitochondria of cockroach, 23 of dragonfly, 24 in light organ, 29, 30 in Malpighian tubes, 61 metabolism of, 11, 14 in muscles, 20, 21 of Rhodnius, 18 in spermatogenesis, 31 in thoracic ganglia, 22 Mochlonyx, 142 Moisture effect of on honey bees, 270-71 on mosquitoes, 140, 141 fruit fly damage and, 363fruit fly history and, 174 Monuron, 274 Moraba scurra (Australian grasshopper), 76, 77, 89, 94, 103 Mordella, 125 Mordellidae, 125 Mordellistena, 125 Mosquito control of, 379, 380 ecology of, 140-41 host relationship of, 141nitrogen metabolism in, 57-58 physiology of, 138 taxonomy of, 136, 137 see also specific names Musca, 25, 303 Musca domestica (house fly) dieldrin susceptibility of, 311 excretory products of, 56 see also Fly, house Muscles flight basic physiology and, 1-16 excitation of, 5-7

fibrillar I, 8-11 innervation of, 5 loading of, 2-3 mechanical properties of, 7-11 metabolism of, 11-14 nonfibrillar, 7-8 phasic type, 1 rapid wing motion of, 2 structure of, 3-5 tonic type, 1 types of, 3-4 micromorphology of, 20-21 neuro junctions, 22 Mycetophagidae, 127 Myiopardalis pardalina, 182 Myochitin junctions, 20 Myrmica rubra, 229 Myrmica scarbinodis, 229 Myxophaga, 111, 112, 114, 126 Myzus circumflexus (lily anhid) amino compounds in, 54 nitrogen metabolism of, 59

Nabam, 274 Nanophyes, 132 Nanophyini, 132 Nasonia vitripennis, 78 Nasutitermes, 156, 160 Nasutitermes arboreus, 154 Nasutitermes maculiventris, 154 Nasutitermitinae, 159-60 Nematocera, 138 Nemonychidae, 130 Neotermes, 155 Neotermes tectonae, 157, 160, 161, 162, 166 Neotran, 274, 366 Nervous system, 21-24 Neuroptera, 4, 72, 86 Neurosecretion, 35-52 activity rhythms and, 43 color changes and, 42-43 definition of, 35 distribution of, 36-38 molting and, 38-42 morphology of, 36-38 reproduction and, 44-45 in subesophageal ganglion, 45-46 water metabolism and. 43-44 Nezara viridula, 6, 7 Nicotine, 274 Nicotine sulphate, 370, 394 Nitidulidae, 118, 124 Nitrogen, 57, 60 Noditermes, 167 Nomadacris, 281, 288 Nomadacris septemfasciata (red locust), 207 control of, 293, 295

forecasting infestation of, 289 migration of, 284, 286-87 outbreak areas of, 282 Nosodendridae, 116, 123 Nosodendron, 123 Nossidium, 119 Noteridae, 114 Nymphalis antiopa, 307

0

Ocellus, 24 Ochodaeus, 120 Odonata, 3, 40, 72 Odontotermes, 158, 159 Oecophylla longinoda, 230 Oedemeridae, 128 Omaliinae, 119 Oncopeltus fasciatus (large milkweed bug) excretory products of, 56 food-plant selection by, 202 Malpighian tubes of, 60, 63 neurosecretion and molting of, 39 neurosecretory cells and egg formation of, 45 nitrogen metabolism of, 58 Oncopera fasciculata, 220-21 Oocyte, 30 Opiine, 186 Opuntia, 228 Oriental roach, see Blatta orientalis Ornithodorus coriaceus, 307 Ornithodorus moubata, 237-38 Orobitis, 132 Orsodacne, 129 Orsodacninae, 129 Orthoptera brain and molting of, 40 chromosomal polymorphism in, 75, 86 cytogenetics of, 69, 71 DDT resistance of, 305-6 flight muscles of, 3, 4, 12 Krebs-Henselet cycle in, 59 pericentric inversion in, 88 Orthotermes, 167 Oryctes rhinoceros, 6, 9-11 Oryssidae, 125 Ostominae, 126 Othreis fullonia, 371 Othreis materna, 371 Otiorrhynchinae, 80 Ovex, 274, 366 Ovipositon behavior food perception and, 197-

food-plant perception and, 196-97, 199 tactile behavior and, 199 Oxycorynidae, 131 Oxpeltini, 129 Oxytelinae, 119 Ozaeninae, 114

Pactopus, 122 Paederinae, 119 Panonychus citri (citrus red mite), 365, 366 Pantomorus godmani (Fuller rose beetle), 370 Papilio ajax, 200, 208 Papilio xuthus, 45 Paracornitermes, 154 Parandra, 128, 129 Parandrinae, 128 Paraneotermes simplicicornis, 157, 166 Parathion control by of citrus scale, 354-67 of fruit fly, 364 of Lepidoptera, 370 of mites, 232 deaths caused by, 396 dermal exposure to, 392 effect on honey bees, 274 house fly resistance to, 313-15 incidental exposure to, 393, 394 mild illness and, 388 poisoning caused by, 392 toxicity and safety of, 388, 390 Paratoxoptera argentinensis, 368 Paratylotropidia brunneri, Paratylotropidia morsei, 72 Parlatoria zizyphus (black parlatoria scale), 360 Parthenogenesis, 78-80, 140 Passolidae, 120 Pathocerus, 129 Paussidae, 113 Paussus, 113, 114 Pea aphid, see Microsiphum pisi Pediculus humanus humanus biological relationship and microbial agents of, 405-20 control of, 379 methoxychlor and, 306 rearing in laboratory, 405-6 resistance to insecticides by, 306 Pediculus longiceps, 414 Pediocirtetes nevadensis.

Peltastica, 123 Pericapritermes, 167 Perinlaneta arsenic resistance of, 318 dieldrin resistance of, 311 flight muscle metabolism of. 12-14 Malpighian tubes in, 62 OP insecticide resistance of. 314 peritrophic membrane of. pyrethrin detoxication by, 316 Periplaneta americana (American cockroach) brain and molting of, 40 chromosomal polymorphism in, 76, 104 chromosome mechanics of, 69, 70 DDT resistance of, 304-6 Malpighian tubes in, 63 meiosis in, 77 metabolism of Systox by, nervous system extracts of, 46, 47 neurosecretion and, 38-42 activity rhythms of, 43 translocations in, 88 Peritrophic membrane, 27 Perkinsiella, 3 Perothops, 122 Perthane, 274 Pesticides deaths caused by, 384, 385, 386, 387 diagnosis of poisoning by, 398-400 disease control and, 379laws regulating, 398 potential hazard of, 383-AR prevention of intoxication by, 397-98 production of, 381-83 in relation to public health, 379-404 routes of exposure to, 391 toxicity and safety relationship of, 388-91 toxicology of, 383-88 treatment of poisoning by, 398-400 and use, 381-83 see also Insecticides Petroleum oil, 354, 357-58, 366, 367 Phalaenoides, 42 Philinae, 128, 129 Philocleon anomalus, 77 Phlebotomus, 135 Phloephilus, 126 Phormia, 18 Phormia regina, 206

Phosdrin, 274, 388 Phostex, 274 Phthirus pubis, 406 Phycosecidae, 126 Phyllocerus, 122 Phyllocnistis citrella (citrus leaf miner), 370 Phyllocoptruta oleivora (citrus or maori mite). 364 Phyllopertha, 119 Phylogeny of Coleoptera. 111-34 Physea, 114 Physiology of excretion, 53-58 Pieris brassicae, 64, 210 Pieris rapae, 210 Piperonyl butoxide, 57 Pissodes approximatus, 74, 75 Pissodes canadensis, 74, 75, 105 Pissodes strobi. 6 Pissodes terminalis, 74, 75, 105 Planococcus citri (citrus mealybug), 55 Platyparea poeciloptera, 182 Platypodidae, 131, 132 Platypus, 132 Pleurosticti, 120 Plodia interpunctella, 307 Plutella maculipennis (diamond back moth). food-plant perception of, 199 chemotactic classification, 210 olfactory stimuli. 200. 201 patterns of, 208 gustatory stimuli of, 203, 205-6 Pogonomyrmex badius (Florida harvester ant), 230 Polymorphism chromosome, 73-76, 86-96 Polyphaga, 111, 112, 113, 114-32 Polyplax, 409, 414 Pompilus plumbeus, 228 Popillia japonica (Japanese beetle), 57 Population absolute, 249 adaptability and chromosomal polymorphism, 96-105 class, 246-47 density of biting flies, 141 distribution, 251-53 frequency, 251-52 spatial, 252-53 temporal, 253

dynamics, 249 of locusts, 285-89 studying, 257 estimating total, 254 experimental, 245-46 index, 247-48 mapping, 254-55 relation to edaphic factors, 255-57 sampling, 243-64 design for, 253-57 mechanics of, 249-51 methods of, 244-49 objects, 244-49 recapture method, 248 sample size, 257-59 variation chromosomal, 95 see also Abundance of insects Porotermes, 154-55 Porotermitinae, 155, 156 Prays endocarpa (citrus rind borer), 371 Predators, 232-34 Prioninae, 128, 129 Procornitermes, 159 Procubitermes, 158, 160 Prodenia, 316 Prolan, 310, 316 Prorhinotermes, 153, 154, 157 Prosimulium ursinum, 140 Protelytridae, 111 Proterhinidae, 131 Protocoleus, 111 Protocucujus, 128 Protoparce quinquemaculata, 307 Protoparce sexta (tobacco hornworm), 307 Psammotermes, 162 Pselaphidae, 119 Psephenidae, 121 Pseudaulacaspis pentagona, 79, 81 Pseudocanthotermes militaris, 160, 162 Pseudococcus brevipes (pineapple mealybug), 54, 55 Psorophora discolor, 142 Pterandrus rosa (Natal fly), 360-62 Pterocolinae, 131 Pteroloma, 119 Pterygota, 36 Ptilliidae, 118 Ptilodactylidae, 121, 122 Ptinidae, 124 Ptinus, 79, 80 Pyrausta nubilalis (European corn borer) amino acid response of, 203 DDT susceptibility of, 306 insecticide control of, 343

sugar content of diet of, 202 Pyrethrin, 274, 316-17 Pyrolan, 361

R

Red-banded leaf roller, see Argyrotaenia velutinana Relative index, 247 Reproduction, 44-45 Reproductive system, 30-32 Reticulitermes, 155, 165 Reticulitermes hesperus, 160, 163, 166 Reticulitermes lucifugus, 161, 166 Rhagoletis, 172 Rhagoletis cerasi, 182 Rhagoletis cingulata, 184-85 diapause of, 179 egg laying of, 176-77, 179 life history of, 173, 174 Rhagoletis completa (walnut husk fly), 182 Rhagoletis indifferens, 184-85 Rhagoletis mendax, 183 Rhagoletis pomonella (apple maggot) life history of, 172, 175, 179 races of, 183-84 Rhagoletis suavis, 174, 175, 178 Rhagoletis symphoricarpi, 183 Rhagoletis zephyria, 183 Rhinomacerini, 130 Rhinotermitidae, 153, 155, 156, 157, 166 Rhinotermitinae, 163 Rhipiceroidea, 121, 122 Rhipiphoridae, 112, 124, 125 Rhodnius, 18, 23, 30, 64 Rhodnius prolixus control of, 379 excretion of, 56 hematocytes and molting of. 40 molting and blood meal of, 41, 48 and neurosecretion of, 38 Rhopalosiphum prinifoliae, 337 Rhynchaenini, 132 Rhynchitinae, 130, 131 Rhynchophora, 115 Rhysodidae, 113, 114, 123 Rice stem borer, see Chilo suppressalis Rickettsiae and lice relationship, 405, 410-15 Roach, 153

see also specific names

Rodolia cardinalis (vedalia beetle), 357 Rotenone, 274 Rutaceae, 201

S

Sabadilla, 274 Sagrinae, 129 Saissetia oleae (black scale), 55, 354, 360 Salivary gland, 26-27, 73 Sandalidae, 122 Sandalus, 122 Saphophagus, 123, 124 Sarcophaga, 25 Sarcophaga bullata, 2 Sarothrias, 123, 124 Saturniidae, 317 Sawfly, 78, 257 see also specific names Scale insects on citrus, 353-60 Scaphidiidae, 119 Scarabaetiormia, 116, 117, 119-21 Scarabaeoidea, 116, 119, 120 Schedorhinotermes, 157 Schistocerca cancellata, 280-81, 283 Schistocerca gregaria (desert locust), 199 control of, 294-95 flight muscles of, 2, 7-8 Malpighian tubes of, 60, migration of, 285, 287 outbreak areas of, 282, 292 phases of, 279-81 Schistocerca gregaria flaviventris, 281, 284 Schistocerca paranensis, 280-81, 283 Schizopus, 121, 122 Schradan, 274, 367, 390 Sciara impatiens, 87 Sciaridae, 87 Scirtothrips citri, 369 Scolytidae, 131, 132 Scydmaenidae, 119 Sensilla, 18 Serritermitinae, 153, 156 Sevin, 274 Sex, 72-73, 167-68 Sialis lutaria, 42, 58 Sicaridae, 30 Silica gel, 274 Silkworm, see Bombyx mori Silphidae, 119 Simplicia, 114 Simuliidae, 73, 79, 135 Simulium, 137, 142, 143 Siricidae, 125 Sitona cylindricollis (sweet clover weevil), 196, 197, Sitona lineata, 199, 202 Solenobia triquetrella, 76 Solenopsis geminata, 230 Solenopsis saevissima v. richteri (fire ant), 230, 238 Solenopsis xyloni, 230 Speculitermes, 162 Spercheus, 117 Spermatogenesis, 30, 76 Sphaeriidae, 111 Sphaerites, 118, 124 Sphaerotermes sphaerothorax, 159, 167 Sphindidae, 123, 127, 128 Spirochetes, 405, 415-18 Spruce budworm, see Choristoneura fumiferana Staley's sauce no. 7, 361 Staphylinidae, 116, 119 Staphyliniformia, 115-19, 121, 124 Staphylininae, 119 Staphylinoidea, 117-18 Stegobium paniceum (drug store beetle), 62 Steneotarsonemus pallidus (cyclamen mite), 232-34 Steninae, 119 Stenopelmus, 132 Stolotermes, 154, 155 Stolotermitinae, 155, 156 Stomoxys, 135 Strepsiptera, 115 Strobane, 274 Stylopoidea, 112-13, 125 Subesophageal ganglion, 45 Subulitermes, 154 Sulphenone, 274 Sulphur, 274, 364, 367 Sweet clover weevil, see Sitona cylindricollis Symbiote, 186-87, 405 Syntelia, 118 Syntermes, 160 Systematics see Taxonomy Systox, 57, 274

T

Tabanidae, 135
Tabanus, 64
Tabanus sulcifrons, 137, 140
Tachycines, 12
Tapinoma, 368
Tariar emetic, 369
Taurocerastes, 120
Taxonomy
of biting flies, 135-40
of fruit fly, 171
of termites, 153-54
TDE, 274
Tedion, 274, 367
Telegeusis, 122

Temperature chromosomal variation of and fecundity, 97 and larval survival. 91 and longevity, 95-96, 97 and viability, 97 and citrus mite rearing, 366 effect of on copulation, 174, 175 on egg development, 185 on flight, 141 on heterozygotes, 88 on honey bees, 266-67 270-71 on mosquitoes, 141 and fruit fly life history, 172, 174, 176, 178, 179 and mosquito larva preference, 139 see also Distribution of insects Tenebrio arsenic resistance of, 318 DDT effect on, 303 flight muscle of excitation, 6 peritrophic membrane of, 26 Tenebrio molitor, 17, 59, Tenthredo acerrima, 74 Tenuirostritermes tenuirostris, 154, 160, 164, 167, 168 Tephritidae adult of, 175-77 biology of, 171-92 larva of, 177-78 pupa of, 178-79 Tephritinae, 171 TEPP, 274, 390 Teredilia, 116, 123 Termes, 155, 158, 167 Termites biology of, 153-70 castes of, 162-68 replacement reproductives, 165-67 sexual dimorphism, 167-68 soldiers, 162-64 workers, 164-65 distribution of, 154-56

evolution of, 153-70 feeding of, 156 flight of, 160-62 geographical origin of, 154-56 nests of, 156-60 taxonomy of, 153-54 see also specific names Termitidae, 153-57, 162, 165 Termitinae, 155, 158, 167 Termopsidae, 153-57 Termopsinae, 155, 156, 162, 165 Tetrahymena, 60 Tetranychus bimaculatus, 316 Tetranychus cinnabarinus. 316 Tetratoma, 127 Thaumaphrastus, 123 Thimet, 388 Thiodan, 274 Thiram, 274 Thomisidae, 30 Thoracotermes, 158, 167 Thorictidae, 123 Thorictodes, 123 Thrips imaginis, 227 Thyanta, 81 Thymelicus acteon, 104 Thysanura, 3 Tineola bisselliella (webbing clothes moth), 26, 56 Tipula maxima, 71 Tobacco hornworm, see Protoparce sexta Tonica zizyphi (citrus leaf roller), 371 Toxaphene control of fruit fly, 364 effect on honey bees, 274 ellness caused by, 395 Toxoptera aurantii (green citrus aphid), 368 Toxotrypana, 171, 175 Tracheal system, 18-19 Trachypachidae, 113 Tribolium confusum (confused flour beetle). 205 Trichoptera, 4 Trimerotropis, 103 Trinervitermes, 156, 160, 166, 167 Trithion, 274, 364, 366-67

Trixagidae, 122
Trixagus, 122
Trixagus, 120
Trogositidae, 126
Trypetidae, 127
Trypetidae, 171
Tshekardocoleus, 111
Tuberolachnus salignus, 53, 55, 56, 59
Tumulitermes, 160
Typhlodromus cucumeris, 232-34
Typhlodromus occidentalis, 234

U

Umbelliferae, 201 Unaspis yanonensis, 357, 359 Uralotermitidae, 153 Urodon, 130

V

Vesperini, 129

W

Wasp, 21, 22, 78 Wax moth, see Galleria mellonella Weather, 220-25, 288 Wireworms, 195

х

X-organ, 36 Xylocopa, 61 Xylomyges curialis, 370

Y

Yellow mealworm, see Tenebrio molitor

Z

Zeugophora, 129 Zineb, 274, 364 Ziram, 274 Zootermopsis, 162, 165, 166 Zootermopsis laticeps, 160, 161 Zootermopsis nevadensis, 163

## CUMULATIVE INDEX OF CHAPTER TITLES

### VOLUMES 1-5

Titles of volume chapters are arranged in groups according to general descriptive topics. Within each group, titles are arranged in chronological order. It should be understood that the topic categories are arbitrary and have been chosen only to assist in indentifying related chapters. For more detailed indexing, see the Subject Index at the end of each volume.

ACARACIDES			
(see	Insecticides)		

Control

APICULTURE		
The "Language" and Orientation of the Honey		
Bee	K. von Frisch, M. Lindauer	1: 45-58
Some Recent Advances in Apicultural		
Research	C. G. Butler	1: 281-98
Genetics and Breeding of the Honey Bee	W. C. Rothenbuhler	3: 161-80
The Use of Honey Bees in the Production		
of Crops	F. E. Todd, S. E. McGregor	5: 265-78
APPLICATION		
Apparatus for Application of Insecticides	J. L. Brann, Jr.	1: 241-60
Aerial Application of Insecticides	F. E. Welck, G. A. Roth	2: 297-318
Some Aspects of the Application of		
Insecticides	R. J. Courshee	5: 327-52
BIOLOGICAL CONTROL		
Biological Control of Insect Pests	C. P. Clausen	3: 291-310
Biological Control of Weeds with Insects	C. B. Huffaker	4: 251-76
Microbial Control of Insect Pests	Y. Tanada	4: 277-302
Prov oov		
BIOLOGY Biology of Scarabaeidae	P. O. Ritcher	3: 311-34
Ecology of Cerambycidae	E. G. Linsley	4: 99-138
Biology of Aphids	J. S. Kennedy, H. L. G.	1. 00 100
Diology of Lipinas	Stroyan	4: 139-60
The Biology of Parasitic Hymenoptera	R. L. Doutt	4: 161-82
Evolution and Biology of the Termites	F. M. Weesner	5: 153-70
Biology of Fruit Flies	L. D. Christenson, R. Foote	
DIA DATIGE		
DIAPAUSE The Physiology and Biochemistry of Diapause	A. D. Lees	1: 1-16
The Physiology and Biochemistry of Diapause	A. D. Lees	1: 1-16
ECOLOGY		
(see also Population Ecology and Ethology)		
Resistance of Plants to Insects	R. H. Painter	3: 267-91
Ecology of Cerambycidae	E. G. Linsley	4: 99-138
Bioclimatic Studies with Insects	P. S. Messenger	4: 183-206
Host Selection in Phytophagous Insects	A. J. Thorsteinson	5: 193-218
ECONOMIC ENTOMOLOGY		
Soil Insects and Their Control	J. H. Lilly	1: 203-22
Stored Product Entomology	E. A. Parkin	1: 223-40
Effect of Pesticides on Balance of Arthropod		
Populations	W. E. Ripper	1: 403-38
Cotton Insects and Their Control in the		
United States	J. C. Gaines	2: 319-38
Organic Phosphorus Insecticides for Control		
of Field Crop Insects	W. A. L. David	3: 377-400
Forage Insects and Their Control	G. G. Gyrisco	3: 421-48
Deciduous Fruit Insects and Their Control Seed Treatment as a Method of Insect	M. M. Barnes	4: 343-62
Control	W H Lange To	4. 969 00

W. H. Lange, Jr.

4: 363-88

### VOLUMES 1-5

The Biological Background of Locust Control Citrus Insects and Mites	D. L. Gunn L. R. Jeppson, G. E.	5: 279-300
	Carman	5: 353-78
ERADICATION		
(see Quarantine)		
ETHOLOGY		
Insect Migration	C. B. Williams	2: 163-80
Uses of Sounds by Insects	H. Frings, M. Frings	3: 87-106
Ethological Studies of Insect Behavior	G. P. Baerends	4: 207-34
FOREST ENTOMOLOGY		
Ecology of Forest Insects	S. A. Graham	1: 261-80
Control of Forest Insects	R. E. Balch	3: 449-68
GENETICS		
Cytogenetics and Systematic Entomology	M. J. D. White	2: 71-90
Genetics and Breeding of the Honey Bee	W. C. Rothenbuhler	3: 161-80
Cytogenetics of Insects	S. G. Smith	5: 69-84
Chromosomal Variation and Adaptation in		
Insects	A. B. da Cunha	5: 85-110
INSECTICIDES		
(see also Mode of Action of Insecticides)		
The Chemistry of Insecticides	H. Martin	1: 149-66
Persisting Insecticide Residues in Plant		4 400 00
Materials Repellents	F. A. Gunther, R. C. Blinn V. G. Dethier	1: 167-80 1: 181-202
The Behaviour of Systemic Insecticides	v. G. Detnier	1: 181-202
Applied to Plants	S. H. Bennett	2: 279-96
Biological Assay of Insecticide Residues	S. Nagasawa	4: 319-54
Pesticides in Relation to Public Health	W. J. Hayes, Jr.	5: 379-404
INSECT VECTORS		
Insect Transmission of Plant Viruses	F. F. Smith, P. Brierley	1: 299-322
Insecticidal Control of the Spread of Plant		
Viruses	L. Broadbent	2: 339-54
Transmission of Plant Viruses by Arthropods	K. M. Smith	3: 469-82
MEDICAL AND VETERINARY ENTOMOLOGY		
Nonbiting Flies and Disease	D. R. Lindsay,	
	H. I. Scudder	1: 323-46
Veterinary and Medical Acarology	H. S. Fuller	1: 347-66
Recent Advances in Veterinary Entomology	A. W. Lindquist, E. F.	
Transmission of Disease Agents by	Knipling	2: 181-202
Phlebotomine Sand Flies	S. Adler, O. Theodor	2: 203-26
Insecticides for Control of Adult Diptera	R. W. Fay,	2. 200-20
	J. W. Kilpatrick	3: 401-20
Fleas and Disease	W. L. Jellison	4: 389-414
Insects and Epidemiology of Malaria	P. F. Russell	4: 415-34
Northern Biting Flies	B. Hocking	5: 135-52
Biological Relationships Between Lice (Anoplura) and Microbial Agents	F. Weyer	5: 405-20
	,	.,
MODE OF ACTION OF INSECTICIDES	C W V	1. 100 10
The Mode of Action of Insecticides The Mode of Action of Insecticides Exclusive	C. W. Kearns	1: 123-48
of Organic Phosphorus Compounds	P. A. Dahm	2: 247-60
Chemistry and Mode of Action of Organo-	· , A. Danin	2. 241-00
phosphorus Insecticides	E. Y. Spencer, R. D. O'Brien	2: 261-78
The Chemistry and Action of Acaricides	R. B. March	3: 355-76
	F. W. P. Winteringham,	
On the Mode of Action of Insecticides	r. w. P. winteringnam,	

### CHAPTER TITLE INDEX

### VOLUMES 1-5

MORPHOLOGY		
The Comparative Morphology of the Insect		
Head	E. M. DuPorte	2: 55-70
Ovarian Structure and Vitellogenesis in Insects	D. F. Bester	3: 137-60
Insect Blood Cells	P. F. Bonhag V. B. Wigglesworth	4: 1-16
Insect Micromorphology	G. A. Edwards	5: 17-34
NOMENCLATURE		
The Stability of Scientific Names	R. L. Usinger	1: 59-70
NUTRITION		
Insect Nutrition	H. Lipke, G. Fraenkel	1: 17-44
Nutritional Requirements of Phytophagous Insects	W. G. Friend	3: 57-74
	5. 11.0	0. 0
PHYSIOLOGY		
Digestion in Insects Some Aspects of Intermediary Metabolism	D. F. Waterhouse	2: 1-18
of Carbohydrates in Insects	M. Rockstein	2: 19-36
The Physiology of Insect Cuticle	V. B. Wigglesworth	2: 37-54
The Nervous System	K. D. Roeder	3: 1-18
Chemoreception in Arthropods	E. S. Hodgson	3: 19-36
Internal Symbiosis in Insects	A. G. Richards, M. A.	
	Brooks	3: 37-56
Culture of Insect Tissues	M. F. Day, T. D. C. Grace	4: 17-38
Pheromones (Ectohormones) in Insects	P. Karlson, A. Butenandt	4: 39-58
Insect Pigments	R. I. T. Cromartie	4: 59-76
Insect Flight Muscles and Their Basic Physiology	E. G. Boettiger	5: 1-16
Neurosecretion in Insects	W. G. Van der Kloot	5: 35-52
The Physiology of Excretion in the Insect	R. Craig	5: 53-68
POLLINATION		
(see also Apiculture)		
Pollination of Alfalfa and Red Clover	G. E. Bohart	2: 355-80
POPULATION ECOLOGY		
The Fundamental Theory of Natural and		
Biological Control	W. R. Thompson	1: 379-402
Dynamics of Insect Populations	M. E. Solomon	2: 121-42
The Synoptic Approach to Studies of Insects		
and Climate	W. G. Wellington	2: 143-62
Dynamics of Insect Populations	A. J. Nicholson	3: 107-36
Experimental Host-Parasite Populations	T. Burnett	4: 235-50
Some Recent Contributions to the Study of the	H. G. Andrewartha, L. C. Birch	5: 219-42
Distribution and Abundance of Insects Sampling Insect Populations	R. F. Morris	5: 219-42 5: 243-64
	N. 1. MOI 15	0. 210-01
QUARANTINE Modern Quarantine Problems	A. F. Camp	1: 367-78
Insect Eradication Programs	W. L. Popham, D. G. Hall	3: 335-54
RESISTANCE TO CHEMICALS		
Arthropod Resistance to Chemicals	W. M. Hoskins, H. T.	
•	Gordon	1: 89-122
Genetics of Insect Resistance to Chemicals	J. F. Crow	2: 227-46
Mechanisms of Resistance Against Insecticides	A. W. A. Brown	5: 301-26
		3, 002-40
SERICULTURE		
Recent Advances in Silkworm Nutrition	J. M. Legay	3: 75-86
SOCIAL INSECTS		
Caste Determination in Social Insects	M. V. Brian	2: 107-20

### CHAPTER TITLE INDEX

VOLUMES 1-5

## SYSTEMATICS

Some Aspects of Geographic Variation in Insects The Taxonomic Significance of the Characters of Immature Insects The Phylogeny of the Panorpoid Orders

Zoogeography of Insects Hybridization and Speciation in Mosquitoes

The Feeding Habits of Biting Flies and Their Significance in Classification

Taxonomic Problems with Closely Related Species

The Phylogeny of Coleoptera

Kitzmiller

T. H. Hubbell 1: 71-88

449

3: 231-48

F. I. van Emden H. E. Hinton J. L. Gressitt 2: 91-106 3: 181-206 3: 207-30 L. E. Rozeboom, J. B.

J. A. Downes 3: 249-66

W. J. Brown 4: 77-98 R. A. Crowson 5: 111-34

### CUMULATIVE INDEX OF CONTRIBUTING AUTHORS

### VOLUMES 1-5

A listing of volume and page numbers for each contributing author in the first five volumes.

#### A

Adler, S., 2: 203 Andrewartha, H. G., 5: 219

#### B

Baerends, G. P., 4: 207
Balch, R. E., 3: 449
Barnes, M. M., 4: 343
Bennett, S. H., 2: 279
Birch, L. C., 5: 219
Bilnn, R. C., 1: 167
Boettiger, E. G., 5: 1
Bohart, G. E., 2: 355
Bonhag, P. F., 3: 137
Brann, J. L., Jr., 1: 241
Brian, M. V., 2: 107
Brierley, P., 1: 299
Broadbent, L., 2: 339
Brooks, M. A., 3: 37
Brown, A. W. A., 5: 301
Brown, W. J., 4: 77
Burnett, T., 4: 235
Butlenandt, A., 4: 39
Butler, C. G., 1: 281

#### -

Camp, A. F., 1: 367
Carman, G. E., 5: 353
Christenson, L. D., 5: 171
Clausen, C. P., 3: 291
Courshee, R. J., 5: 327
Craig, R., 5: 53
Cromartie, R. I. T., 4: 59
Crow, J. F., 2: 227
Crowson, R. A., 5: 111
Cunha, A. B., da, 5: 85

#### D

da Cunha, A. B., see Cunha, A. B. da Dahm, P. A., 2: 247 David, W. A. L., 3: 377 Day, M. F., 4: 17 Dethier, V. G., 1: 181 Downes, J. A., 3: 249 DuPorte, E. M., 2: 55

#### E

Edwards, G. A., 5: 17 Emden, F. I. van, 2: 91

#### F

Fay, R. W., 3: 401 Foote, R. H., 5: 171 Fraenkel, G., 1: 17 Friend, W. G., 3: 57 Frings, H., 3: 87 Frings, M., 3: 87 Frisch, K. von, 1: 45 Fuller, H. S., 1: 347

#### -

Gaines, J. C., 2: 319 Gordon, H. T., 1: 89 Grace, T. D. C., 4: 17 Graham, S. A., 1: 261 Gressitt, J. L., 3: 207 Gunn, D. L., 5: 279 Gunther, F. A., 1: 167 Gyrisco, G. G., 3: 421

#### E

Hall, D. G., 3: 335 Hayes, W. J., Jr., 5: 379 Hinton, H. E., 3: 181 Hocking, B., 5: 135 Hodgson, E. S., 3: 19 Hoskins, W. M., 1: 89 Hubbell, T. H., 1: 71 Huffaker, C. B., 4: 251

#### J

Jellison, W. L., 4: 389 Jeppson, L. R., 5: 353

#### K

Karlson, P. 4: 39 Kearns, C. W., 1: 123 Kennedy, J. S., 4: 139 Kilpatrick, J. W., 3: 401 Kitzmiller, J. B., 3: 231 Knipling, E. F., 2: 181

Lange, W. H., Jr., 4: 363 Lees, A. A., 1: 1 Legay, J. M., 3: 75 Lewis, S. E., 4: 303 Lilly, J. H., 1: 203 Lindauer, M., 1: 45 Linday, D. R., 1: 323 Linsley, E. G., 4: 99

### Lipke, H., 1: 17

#### 24

McGregor, S. E., 5: 265 March, R. B., 3: 355 Martin, H., 1: 149 Messenger, P. S., 4: 183 Morris, R. F., 5: 243

#### N

Nagasawa, S., 4: 319 Nicholoson, A. J., 3: 107

#### C

O'Brien, R. D., 2: 261

#### P

Painter, R. H., 3: 267 Parkin, E. A., 1: 223 Popham, W. L., 3: 335

#### F

Richards, A. G., 3: 37 Ripper, W. E., 1: 403 Ritcher, P. O., 3: 311 Rockstein, M., 2: 19 Roeder, K. D., 3: 1 Roth, G. A., 2: 297 Rothenbuhler, W. C., 3: 161 Rozeboom, L. E., 3: 231 Russell, P. F., 4: 415

#### 8

Scudder, H. I., 1: 323 Smith, F. F., 1: 299 Smith, K. M., 3: 469 Smith, S. G., 5: 69 Solomon, M. E., 2: 121 Spencer, E. Y., 2: 261 Stroyan, H. L. G., 4: 139

#### T

Tanada, Y., 4: 277 Theodor, O., 2: 203 Thompson, W. R., 1: 369 Thorsteinson, A. J., 5: 193 Todd, F. E., 5: 265

#### U

Usinger, R. L., 1: 59

### VOLUMES 1-5

v

Van der Kloot, W. G., 5: 35 van Emden, F. I., see Emden, F. I. van von Frisch, K., see Frisch, K. von Waterhouse, D. F., 2: 1 Weesner, F. M., 5: 153 Weick, F. E., 2: 297 Wellington, W. G., 2: 143 Weyer, F., 5: 405 White, M. J. D., 2: 71 Wigglesworth, V. B., 2: 37; 4: 1 Williams, C. B., 2: 163 Winteringham, F. P. W., 4: 303